

# SEQUENCE LISTING

<110> Whitehead, Stephen S.  
 Murphy, Brian R.  
 Hanley, Kathryn A.  
 Blaney, Joseph E. Jr.

<120> DEVELOPMENT OF MUTATIONS USEFUL FOR  
 ATTENUATING DENGUE VIRUSES AND CHIMERIC DENGUE VIRUSES

<130> NIH214.001C1

<150> PCT/US02/16308

<151> 2002-05-22

<150> US 60/293049

<151> 2001-05-22

<160> 70

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 900

<212> PRT

<213> Dengue 4 virus

<400> 1

Gly	Thr	Gly	Thr	Gly	Glu	Thr	Leu	Gly	Glu	Lys	Trp	Lys	Arg	Gln	
1			5					10					15		
Leu	Asn	Ser	Leu	Asp	Arg	Lys	Glu	Phe	Glu	Glu	Tyr	Lys	Arg	Ser	Gly
			20					25					30		
Ile	Leu	Glu	Val	Asp	Arg	Thr	Glu	Ala	Lys	Ser	Ala	Leu	Lys	Asp	Gly
			35					40					45		
Ser	Lys	Ile	Lys	His	Ala	Val	Ser	Arg	Gly	Ser	Ser	Lys	Ile	Arg	Trp
	50					55					60				
Ile	Val	Glu	Arg	Gly	Met	Val	Lys	Pro	Lys	Gly	Lys	Val	Val	Asp	Leu
65					70					75					80
Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	Tyr	Met	Ala	Thr	Leu	Lys	Asn
				85					90					95	
Val	Thr	Glu	Val	Lys	Gly	Tyr	Thr	Lys	Gly	Gly	Pro	Gly	His	Glu	Glu
			100					105					110		
Pro	Ile	Pro	Met	Ala	Thr	Tyr	Gly	Trp	Asn	Leu	Val	Lys	Leu	His	Ser
		115					120					125			
Gly	Val	Asp	Val	Phe	Tyr	Lys	Pro	Thr	Glu	Gln	Val	Asp	Thr	Leu	Leu
		130				135					140				
Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Asn	Pro	Thr	Ile	Glu	Glu	Gly	Arg
145					150					155					160
Thr	Leu	Arg	Val	Leu	Lys	Met	Val	Glu	Pro	Trp	Leu	Ser	Ser	Lys	Pro
			165						170					175	
Glu	Phe	Cys	Ile	Lys	Val	Leu	Asn	Pro	Tyr	Met	Pro	Thr	Val	Ile	Glu
			180					185					190		
Glu	Leu	Glu	Lys	Leu	Gln	Arg	Lys	His	Gly	Gly	Asn	Leu	Val	Arg	Cys
		195					200					205			
Pro	Leu	Ser	Arg	Asn	Ser	Thr	His	Glu	Met	Tyr	Trp	Val	Ser	Gly	Ala
	210					215					220				
Ser	Gly	Asn	Ile	Val	Ser	Ser	Val	Asn	Thr	Thr	Ser	Lys	Met	Leu	Leu
225					230					235					240
Asn	Arg	Phe	Thr	Thr	Arg	His	Arg	Lys	Pro	Thr	Tyr	Glu	Lys	Asp	Val

				245								250								255	
Asp	Leu	Gly	Ala	Gly	Thr	Arg	Ser	Val	Ser	Thr	Glu	Thr	Glu	Lys	Pro						
			260																		
Asp	Met	Thr	Ile	Ile	Gly	Arg	Arg	Leu	Gln	Arg	Leu	Gln	Glu	Glu	His						
			275																		
Lys	Glu	Thr	Trp	His	Tyr	Asp	Gln	Glu	Asn	Pro	Tyr	Arg	Thr	Trp	Ala						
			290																		
Tyr	His	Gly	Ser	Tyr	Glu	Ala	Pro	Ser	Thr	Gly	Ser	Ala	Ser	Ser	Met						
			305																		
Val	Asn	Gly	Val	Val	Lys	Leu	Leu	Thr	Lys	Pro	Trp	Asp	Val	Ile	Pro						
				325																	
Met	Val	Thr	Gln	Leu	Ala	Met	Thr	Asp	Thr	Thr	Pro	Phe	Gly	Gln	Gln						
			340																		
Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	Arg	Thr	Pro	Gln	Pro	Lys	Pro						
			355																		
Gly	Thr	Arg	Met	Val	Met	Thr	Thr	Ala	Asn	Trp	Leu	Trp	Ala	Leu							
			370																		
Leu	Gly	Lys	Lys	Lys	Asn	Pro	Arg	Leu	Cys	Thr	Arg	Glu	Glu	Phe	Ile						
			385																		
Ser	Lys	Val	Arg	Ser	Asn	Ala	Ala	Ile	Gly	Ala	Val	Phe	Gln	Glu	Glu						
				405																	
Gln	Gly	Trp	Thr	Ser	Ala	Ser	Glu	Ala	Val	Asn	Asp	Ser	Arg	Phe	Trp						
			420																		
Glu	Leu	Val	Asp	Lys	Glu	Arg	Ala	Leu	His	Gln	Glu	Gly	Lys	Cys	Glu						
			435																		
Ser	Cys	Val	Tyr	Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Leu	Gly	Glu						
			450																		
Phe	Gly	Arg	Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly						
			465																		
Ala	Arg	Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His						
				485																	
Trp	Phe	Gly	Arg	Glu	Asn	Ser	Trp	Ser	Gly	Val	Glu	Gly	Glu	Gly	Leu						
			500																		
His	Arg	Leu	Gly	Tyr	Ile	Leu	Glu	Glu	Ile	Asp	Lys	Lys	Asp	Gly	Asp						
			515																		
Leu	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile	Thr	Glu						
			530																		
Asp	Asp	Leu	Gln	Asn	Glu	Glu	Leu	Ile	Thr	Glu	Met	Ala	Pro	His							
			545																		
His	Lys	Ile	Leu	Ala	Lys	Ala	Ile	Phe	Lys	Leu	Thr	Tyr	Gln	Asn	Lys						
				565																	
Val	Val	Lys	Val	Leu	Arg	Pro	Thr	Pro	Arg	Gly	Ala	Val	Met	Asp	Ile						
			580																		
Ile	Ser	Arg	Lys	Asp	Gln	Arg	Gly	Ser	Gly	Gln	Val	Gly	Thr	Tyr	Gly						
			595																		
Leu	Asn	Thr	Phe	Thr	Asn	Met	Glu	Val	Gln	Leu	Ile	Arg	Gln	Met	Glu						
			610																		
Ala	Glu	Gly	Val	Ile	Thr	Gln	Asp	Asp	Met	Gln	Asn	Pro	Lys	Gly	Leu</						

Gly	Arg	Ala	Arg	Ile	Ser	Gln	Gly	Ala	Gly	Trp	Ser	Leu	Arg	Glu	Thr
			740					745					750		
Ala	Cys	Leu	Gly	Lys	Ala	Tyr	Ala	Gln	Met	Trp	Ser	Leu	Met	Tyr	Phe
		755					760					765			
His	Arg	Arg	Asp	Leu	Arg	Leu	Ala	Ser	Met	Ala	Ile	Cys	Ser	Ala	Val
	770					775					780				
Pro	Thr	Glu	Trp	Phe	Pro	Thr	Ser	Arg	Thr	Thr	Trp	Ser	Ile	His	Ala
785					790				795					800	
His	His	Gln	Trp	Met	Thr	Thr	Glu	Asp	Met	Leu	Lys	Val	Trp	Asn	Arg
				805					810					815	
Val	Trp	Ile	Glu	Asp	Asn	Pro	Asn	Met	Thr	Asp	Lys	Thr	Pro	Val	His
			820					825					830		
Ser	Trp	Glu	Asp	Ile	Pro	Tyr	Leu	Gly	Lys	Arg	Glu	Asp	Leu	Trp	Cys
		835					840					845			
Gly	Ser	Leu	Ile	Gly	Leu	Ser	Ser	Arg	Ala	Thr	Trp	Ala	Lys	Asn	Ile
	850				855						860				
His	Thr	Ala	Ile	Thr	Gln	Val	Arg	Asn	Leu	Ile	Gly	Lys	Glu	Glu	Tyr
865					870				875					880	
Val	Asp	Tyr	Met	Pro	Val	Met	Lys	Arg	Tyr	Ser	Ala	Pro	Ser	Glu	Ser
				885					890					895	
Glu	Gly	Val	Leu												
			900												

<210> 2  
 <211> 233  
 <212> DNA  
 <213> Dengue 4 virus

<400> 2  
 gactagcggt tagaggagac ccctcccatc actgataaaa cgcagcaaaa gggggcccga 60  
 agccaggagg aagctgtact cctggtggaa ggactagagg ttagaggaga ccccccaac 120  
 acaaaaacag catattgacg ctgggaaaga ccagagatcc tgctgtctct gcaacatcaa 180  
 tccaggcaca gagcgccgca agatggattg gtgttgttga tccaacaggt tct 233

<210> 3  
 <211> 228  
 <212> DNA  
 <213> Dengue 1 virus

<400> 3  
 gactagtgggt tagaggagac ccctcccaag acacaacgca gcagcggggc ccaacaccag 60  
 gggaagctgt accctggttg taaggactag aggttagagg agaccccccg cacaacaaca 120  
 aacagcatat tgacgctggg agagaccaga gatcctgctg tctctacagc atcattccag 180  
 gcacagaacg ccaaaaaatg gaatggtgct gttgaatcaa caggttct 228

<210> 4  
 <211> 230  
 <212> DNA  
 <213> Dengue 2 virus

<400> 4  
 gactagcggt tagaggagac ccctccctta caaatcgag caacaatggg ggcccaaggt 60  
 gagatgaagc tgtagtctca ctggaaggac tagaggttag aggagacccc ccaaaaaca 120  
 aaaacagcat attgacgctg ggaaagacca gagatcctgc tgtctcctca gcatcattcc 180  
 aggcacagaa cgccagaaaa tggaatggtg ctgttgaatc aacaggttct 230

<210> 5  
 <211> 227  
 <212> DNA  
 <213> Dengue 3 virus

<400> 5  
gactagtggg tagaggagac ccctcccatg acacaacgca gcagcggggc ccgagcactg 60  
agggaaagctg tacctccttg caaaggacta gaggttatag gagaccccc gcaaacaaaa 120  
acagcatatt gacgctggga gagaccagag atcctgctgt ctcctcagca tcattccagg 180  
cacagaacgc cagaaaatgg aatggtgctg ttgaatcaac aggttct 227

<210> 6  
<211> 227  
<212> DNA  
<213> West Nile virus

<400> 6  
gactagaggt tagaggagac cccgcgtaaa aaagtgcacg gcccaacttg gctgaagctg 60  
taagccaagg gaaggactag aggttagagg agaccccgtag ccaaaaacac caaaagaaac 120  
agcatattga cacctgggat agactagggg atcttctgct ctgcacaacc agccacacgg 180  
cacagtgcgc cgacataggt ggctggtggt gctagaacac aggatct 227

<210> 7  
<211> 229  
<212> DNA  
<213> Japanese encephalitis virus

<400> 7  
gactagaggt tagaggagac cccgtggaaa caacaacatg cggcccaagc cccctcgaag 60  
ctgtagagga ggtggaagga ctagaggtta gaggagaccc cgcatttgca tcaaacagca 120  
tattgacacc tgggaataga ctgggagatc ttctgctcta tctcaacatc agctactagg 180  
cacagagcgc cgaagtatgt acgtggtggt gaggaagaac acaggatct 229

<210> 8  
<211> 241  
<212> DNA  
<213> Yellow fever virus

<400> 8  
aacctggttt ctgggacctc ccaccccaga gtaaaaagaa cggagcctcc gctaccaccc 60  
tcccacgtgg tggtagaaag acgggggtcta gaggttagag gagaccctcc agggaaacaaa 120  
tagtgggacc atattgacgc cagggaaaga ccggagtggg tctctgcttt tcctccagag 180  
gtctgtgagc acagtttgct caagaataag cagacctttg gatgacaaac aaaaaccac 240  
t 241

<210> 9  
<211> 249  
<212> DNA  
<213> Powassan virus

<400> 9  
aaacgaactt tgtgagacca aaaggcctcc tggaaggctc accaggagtt aggccgttta 60  
ggagcccccg agcataactc gggaggaggg aggaagaaaa ttggcaatct tcctcgggat 120  
ttttccgcct cctataacta atttccccca ggaaactggg ggggcggttc ttgttctccc 180  
tgagccacca ccatccaggc acagatagcc tgacaaggag atggtgtgtg actcggaaaa 240  
acacccgct 249

<210> 10  
<211> 250  
<212> DNA  
<213> Louping ill virus

<400> 10  
tgcaagattt tgcgagaccc cccgccccat gacaaggccg aacatggagc attaaaggga 60  
ggcccccgga agcatgcttc cgggaggagg gaagagagaa attggcagct ctcttcaggg 120

```

tttttctccc tcctatacca aatttccccc tcgacagagg gggggcggtt cttgttctcc 180
ctgagccacc atcaccaga cacagatagt ctgacaagga ggtgatgtgt gactcgaaa 240
aacaccgct 250

```

```

<210> 11
<211> 250
<212> DNA
<213> Tick-borne encephalitis virus

```

```

<400> 11
tgaaaaattt tgtgagaccc cctgcatcat gataaggccg aacatggtgc atgaaagggg 60
aggcccccgg aagcacgctt ccgggaggag ggaagagaga aattggcagc tctcttcagg 120
atttttcttc ctctataaca aaattccccc tcggtagagg gggggcggtt cttgttctcc 180
ctgagccacc atcaccaga cacaggtagt ctgacaagga ggtgatgtgt gactcgaaa 240
aacaccgct 250

```

```

<210> 12
<211> 247
<212> DNA
<213> Langat virus

```

```

<400> 12
tgtgaaactt tgtgagaccc cttgcgtcca gagaaggccg aactgggcgt tataaggagg 60
ccccaggagg gaaacccttg ggaggaggga agagagaaat tggcaactct cttcaggata 120
tttctctctc ctatacaaaa ttccccctcg tcagaggggg ggcggttctt gttctccctg 180
agccaccatc acctagacac agatagtctg aaaaggaggt gatgcgtgtc tcggaaaaac 240
accgct 247

```

```

<210> 13
<211> 3387
<212> PRT
<213> Dengue 4 virus strain 2A

```

```

<400> 13
Met Asn Gln Arg Lys Lys Val Val Arg Pro Pro Phe Asn Met Leu Lys
1 5 10 15
Arg Glu Arg Asn Arg Val Ser Thr Pro Gln Gly Leu Val Lys Arg Phe
20 25 30
Ser Thr Gly Leu Phe Ser Gly Lys Gly Pro Leu Arg Met Val Leu Ala
35 40 45
Phe Ile Thr Phe Leu Arg Val Leu Ser Ile Pro Pro Thr Ala Gly Ile
50 55 60
Leu Lys Arg Trp Gly Gln Leu Lys Lys Asn Lys Ala Ile Lys Ile Leu
65 70 75 80
Ile Gly Phe Arg Lys Glu Ile Gly Arg Met Leu Asn Ile Leu Asn Gly
85 90 95
Arg Lys Arg Ser Thr Ile Thr Leu Leu Cys Leu Ile Pro Thr Val Met
100 105 110
Ala Phe Ser Leu Ser Thr Arg Asp Gly Glu Pro Leu Met Ile Val Ala
115 120 125
Lys His Glu Arg Gly Arg Pro Leu Leu Phe Lys Thr Thr Glu Gly Ile
130 135 140
Asn Lys Cys Thr Leu Ile Ala Met Asp Leu Gly Glu Met Cys Glu Asp
145 150 155 160
Thr Val Thr Tyr Lys Cys Pro Leu Leu Val Asn Thr Glu Pro Glu Asp
165 170 175
Ile Asp Cys Trp Cys Asn Leu Thr Ser Thr Trp Val Met Tyr Gly Thr
180 185 190
Cys Thr Gln Ser Gly Glu Arg Arg Arg Glu Lys Arg Ser Val Ala Leu
195 200 205
Thr Pro His Ser Gly Met Gly Leu Glu Thr Arg Ala Glu Thr Trp Met

```

210		215		220
Ser Ser Glu Gly Ala Trp Lys His Ala Gln Arg Val Glu Ser Trp Ile				
225		230		235
Leu Arg Asn Pro Gly Phe Ala Leu Leu Ala Gly Phe Met Ala Tyr Met				
		245		250
Ile Gly Gln Thr Gly Ile Gln Arg Thr Val Phe Phe Val Leu Met Met				
		260		265
Leu Val Ala Pro Ser Tyr Gly Met Arg Cys Val Gly Val Gly Asn Arg				
		275		280
Asp Phe Val Glu Gly Val Ser Gly Gly Ala Trp Val Asp Leu Val Leu				
		290		295
Glu His Gly Gly Cys Val Thr Thr Met Ala Gln Gly Lys Pro Thr Leu				
305		310		315
Asp Phe Glu Leu Thr Lys Thr Thr Ala Lys Glu Val Ala Leu Leu Arg				
		325		330
Thr Tyr Cys Ile Glu Ala Ser Ile Ser Asn Ile Thr Thr Ala Thr Arg				
		340		345
Cys Pro Thr Gln Gly Glu Pro Tyr Leu Lys Glu Glu Gln Asp Gln Gln				
		355		360
Tyr Ile Cys Arg Arg Asp Val Val Asp Arg Gly Trp Gly Asn Gly Cys				
		370		375
Gly Leu Phe Gly Lys Gly Gly Val Val Thr Cys Ala Lys Phe Ser Cys				
385		390		395
Ser Gly Lys Ile Thr Gly Asn Leu Val Gln Ile Glu Asn Leu Glu Tyr				
		405		410
Thr Val Val Val Thr Val His Asn Gly Asp Thr His Ala Val Gly Asn				
		420		425
Asp Thr Ser Asn His Gly Val Thr Ala Met Ile Thr Pro Arg Ser Pro				
		435		440
Ser Val Glu Val Lys Leu Pro Asp Tyr Gly Glu Leu Thr Leu Asp Cys				
		450		455
Glu Pro Arg Ser Gly Ile Asp Phe Asn Glu Met Ile Leu Met Lys Met				
465		470		475
Lys Lys Lys Thr Trp Leu Val His Lys Gln Trp Phe Leu Asp Leu Pro				
		485		490
Leu Pro Trp Thr Ala Gly Ala Asp Thr Ser Glu Val His Trp Asn Tyr				
		500		505
Lys Glu Arg Met Val Thr Phe Lys Val Pro His Ala Lys Arg Gln Asp				
		515		520
Val Thr Val Leu Gly Ser Gln Glu Gly Ala Met His Ser Ala Leu Ala				
		530		535
Gly Ala Thr Glu Val Asp Ser Gly Asp Gly Asn His Met Phe Ala Gly				
545		550		555
His Leu Lys Cys Lys Val Arg Met Glu Lys Leu Arg Ile Lys Gly Met				
		565		570
Ser Tyr Thr Met Cys Ser Gly Lys Phe Ser Ile Asp Lys Glu Met Ala				
		580		585
Glu Thr Gln His Gly Thr Thr Val Val Lys Val Lys Tyr Glu Gly Ala				
		595		600
Gly Ala Pro Cys Lys Val Pro Ile Glu Ile Arg Asp Val Asn Lys Glu				
		610		615
Lys Val Val Gly Arg Ile Ile Ser Ser Thr Pro Leu Ala Glu Asn Thr				
625		630		635
Asn Ser Val Thr Asn Ile Glu Leu Glu Pro Pro Phe Gly Asp Ser Tyr				
		645		650
Ile Val Ile Gly Val Gly Asn Ser Ala Leu Thr Leu His Trp Phe Arg				
		660		665
Lys Gly Ser Ser Ile Gly Lys Met Phe Glu Ser Thr Tyr Arg Gly Ala				
		675		680
Lys Arg Met Ala Ile Leu Gly Glu Thr Ala Trp Asp Phe Gly Ser Val				
		690		695
				700

Gly 705	Gly	Leu	Phe	Thr	Ser 710	Leu	Gly	Lys	Ala	Val 715	His	Gln	Val	Phe	Gly 720
Ser	Val	Tyr	Thr	Thr 725	Met	Phe	Gly	Gly	Val 730	Ser	Trp	Met	Ile	Arg	Ile 735
Leu	Ile	Gly	Phe 740	Leu	Val	Leu	Trp	Ile 745	Gly	Thr	Asn	Ser	Arg	Asn	Thr 750
Ser	Met	Ala 755	Met	Thr	Cys	Ile	Ala 760	Val	Gly	Gly	Ile	Thr	Leu	Phe	Leu 765
Gly 770	Phe	Thr	Val	Gln	Ala	Asp 775	Met	Gly	Cys	Val	Val	Ser	Trp	Ser	Gly 780
Lys 785	Glu	Leu	Lys	Cys	Gly 790	Ser	Gly	Ile	Phe	Val	Val	Asp	Asn	Val	His 800
Thr	Trp	Thr	Glu	Gln 805	Tyr	Lys	Phe	Gln	Pro 810	Glu	Ser	Pro	Ala	Arg	Leu 815
Ala	Ser	Ala	Ile 820	Leu	Asn	Ala	His	Lys 825	Asp	Gly	Val	Cys	Gly	Ile	Arg 830
Ser	Thr	Thr	Arg 835	Leu	Glu	Asn	Val 840	Met	Trp	Lys	Gln	Ile	Thr	Asn	Glu 845
Leu	Asn	Tyr	Val	Leu	Trp	Glu 850	Gly	Gly	His	Asp	Leu	Thr	Val	Val	Ala 855
Gly 865	Asp	Val	Lys	Gly	Val 870	Leu	Thr	Lys	Gly	Lys	Arg	Ala	Leu	Thr	Pro 875
Pro	Val	Ser	Asp	Leu 885	Lys	Tyr	Ser	Trp	Lys 890	Thr	Trp	Gly	Lys	Ala	Lys 895
Ile	Phe	Thr	Pro 900	Glu	Ala	Arg	Asn	Ser 905	Thr	Phe	Leu	Ile	Asp	Gly	Pro 910
Asp	Thr	Ser 915	Glu	Cys	Pro	Asn	Glu 920	Arg	Arg	Ala	Trp	Asn	Ser	Leu	Glu 925
Val	Glu	Asp 930	Tyr	Gly	Phe	Gly 935	Met	Phe	Thr	Thr	Asn	Ile	Trp	Met	Lys 940
Phe 945	Arg	Glu	Gly	Ser	Ser 950	Glu	Val	Cys	Asp	His 955	Arg	Leu	Met	Ser	Ala 960
Ala	Ile	Lys	Asp	Gln 965	Lys	Ala	Val	His	Ala 970	Asp	Met	Gly	Tyr	Trp	Ile 975
Glu	Ser	Ser	Lys 980	Asn	Gln	Thr	Trp	Gln 985	Ile	Glu	Lys	Ala	Ser	Leu	Ile 990
Glu	Val	Lys 995	Thr	Cys	Leu	Trp	Pro 1000	Lys	Thr	His	Thr	Leu	Trp	Ser	Asn 1005
Gly	Val	Leu 1010	Glu	Ser	Gln	Met	Leu 1015	Ile	Pro	Lys	Ser	Tyr	Ala	Gly	Pro 1020
Phe 1025	Ser	Gln	His	Asn	Tyr 1030	Arg	Gln	Gly	Tyr	Ala 1035	Thr	Gln	Thr	Val	Gly 1040
Pro	Trp	His	Leu	Gly 1045	Lys	Leu	Glu	Ile	Asp	Phe 1050	Gly	Glu	Cys	Pro	Gly 1055
Thr	Thr	Val	Thr 1060	Ile	Gln	Glu	Asp	Cys 1065	Asp	His	Arg	Gly	Pro	Ser	Leu 1070
Arg	Thr	Thr 1075	Ala	Ser	Gly	Lys 1080	Leu	Val	Thr	Gln	Trp	Cys	Cys	Arg	1085
Ser	Cys	Thr 1090	Met	Pro	Pro	Leu 1095	Arg	Phe	Leu	Gly	Glu	Asp	Gly	Cys	Trp 1100
Tyr 1105	Gly	Met	Glu	Ile	Arg 1110	Pro	Leu	Ser	Glu	Lys 1115	Glu	Glu	Asn	Met	Val 1120
Lys	Ser	Gln	Val	Thr 1125	Ala	Gly	Gln	Gly	Thr	Ser 1130	Glu	Thr	Phe	Ser	Met 1135
Gly	Leu	Leu	Cys 1140	Leu	Thr	Leu	Phe	Val 1145	Glu	Glu	Cys	Leu	Arg	Arg	1150
Val	Thr	Arg	Lys 1155	His	Met	Ile	Leu 1160	Val	Val	Val	Ile	Thr	Leu	Cys	Ala 1165
Ile	Ile	Leu	Gly	Gly	Leu	Thr 1170	Trp	Met	Asp	Leu 1175	Leu	Arg	Ala	Leu	Ile 1180
Met	Leu	Gly	Asp	Thr	Met	Ser	Gly	Arg	Ile	Gly	Gly	Gln	Ile	His	Leu 1185

1185		1190		1195		1200
Ala Ile Met Ala Val Phe Lys Met Ser Pro Gly Tyr Val Leu Gly Val						
	1205		1210		1215	
Phe Leu Arg Lys Leu Thr Ser Arg Glu Thr Ala Leu Met Val Ile Gly						
	1220		1225		1230	
Met Ala Met Thr Thr Val Leu Ser Ile Pro His Asp Leu Met Glu Leu						
	1235		1240		1245	
Ile Asp Gly Ile Ser Leu Gly Leu Ile Leu Leu Lys Ile Val Thr Gln						
	1250		1255		1260	
Phe Asp Asn Thr Gln Val Gly Thr Leu Ala Leu Ser Leu Thr Phe Ile						
	1265		1270		1275	1280
Arg Ser Thr Met Pro Leu Val Met Ala Trp Arg Thr Ile Met Ala Val						
	1285		1290		1295	
Leu Phe Val Val Thr Leu Ile Pro Leu Cys Arg Thr Ser Cys Leu Gln						
	1300		1305		1310	
Lys Gln Ser His Trp Val Glu Ile Thr Ala Leu Ile Leu Gly Ala Gln						
	1315		1320		1325	
Ala Leu Pro Val Tyr Leu Met Thr Leu Met Lys Gly Ala Ser Arg Arg						
	1330		1335		1340	
Ser Trp Pro Leu Asn Glu Gly Ile Met Ala Val Gly Leu Val Ser Leu						
	1345		1350		1355	1360
Leu Gly Ser Ala Leu Leu Lys Asn Asp Val Pro Leu Ala Gly Pro Met						
	1365		1370		1375	
Val Ala Gly Gly Leu Leu Leu Ala Ala Tyr Val Met Ser Gly Ser Ser						
	1380		1385		1390	
Ala Asp Leu Ser Leu Glu Lys Ala Ala Asn Val Gln Trp Asp Glu Met						
	1395		1400		1405	
Ala Asp Ile Thr Gly Ser Ser Pro Ile Ile Glu Val Lys Gln Asp Glu						
	1410		1415		1420	
Asp Gly Ser Phe Ser Ile Arg Asp Val Glu Glu Thr Asn Met Ile Thr						
	1425		1430		1435	1440
Leu Leu Val Lys Leu Ala Leu Ile Thr Val Ser Gly Leu Tyr Pro Leu						
	1445		1450		1455	
Ala Ile Pro Val Thr Met Thr Leu Trp Tyr Met Trp Gln Val Lys Thr						
	1460		1465		1470	
Gln Arg Ser Gly Ala Leu Trp Asp Val Pro Ser Pro Ala Ala Thr Lys						
	1475		1480		1485	
Lys Ala Ala Leu Ser Glu Gly Val Tyr Arg Ile Met Gln Arg Gly Leu						
	1490		1495		1500	
Phe Gly Lys Thr Gln Val Gly Val Gly Ile His Met Glu Gly Val Phe						
	1505		1510		1515	1520
His Thr Met Trp His Val Thr Arg Gly Ser Val Ile Cys His Glu Thr						
	1525		1530		1535	
Gly Arg Leu Glu Pro Ser Trp Ala Asp Val Arg Asn Asp Met Ile Ser						
	1540		1545		1550	
Tyr Gly Gly Gly Trp Arg Leu Gly Asp Lys Trp Asp Lys Glu Glu Asp						
	1555		1560		1565	
Val Gln Val Leu Ala Ile Glu Pro Gly Lys Asn Pro Lys His Val Gln						
	1570		1575		1580	
Thr Lys Pro Gly Leu Phe Lys Thr Leu Thr Gly Glu Ile Gly Ala Val						
	1585		1590		1595	1600
Thr Leu Asp Phe Lys Pro Gly Thr Ser Gly Ser Pro Ile Ile Asn Arg						
	1605		1610		1615	
Lys Gly Lys Val Ile Gly Leu Tyr Gly Asn Gly Val Val Thr Lys Ser						
	1620		1625		1630	
Gly Asp Tyr Val Ser Ala Ile Thr Gln Ala Glu Arg Ile Gly Glu Pro						
	1635		1640		1645	
Asp Tyr Glu Val Asp Glu Asp Ile Phe Arg Lys Lys Arg Leu Thr Ile						
	1650		1655		1660	
Met Asp Leu His Pro Gly Ala Gly Lys Thr Lys Arg Ile Leu Pro Ser						
	1665		1670		1675	1680



Ile Val Arg Glu Ala Leu Lys Arg Arg Leu Arg Thr Leu Ile Leu Ala  
 1685 1690 1695  
 Pro Thr Arg Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu  
 1700 1705 1710  
 Pro Ile Arg Tyr Gln Thr Pro Ala Val Lys Ser Glu His Thr Gly Arg  
 1715 1720 1725  
 Glu Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Thr Arg Leu Leu  
 1730 1735 1740  
 Ser Ser Thr Arg Val Pro Asn Tyr Asn Leu Ile Val Met Asp Glu Ala  
 1745 1750 1755 1760  
 His Phe Thr Asp Pro Ser Ser Val Ala Ala Arg Gly Tyr Ile Ser Thr  
 1765 1770 1775  
 Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr Ala Thr Pro  
 1780 1785 1790  
 Pro Gly Ala Thr Asp Pro Phe Pro Gln Ser Asn Ser Pro Ile Glu Asp  
 1795 1800 1805  
 Ile Glu Arg Glu Ile Pro Glu Arg Ser Trp Asn Thr Gly Phe Asp Trp  
 1810 1815 1820  
 Ile Thr Asp Tyr Gln Gly Lys Thr Val Trp Phe Val Pro Ser Ile Lys  
 1825 1830 1835 1840  
 Ala Gly Asn Asp Ile Ala Asn Cys Leu Arg Lys Ser Gly Lys Lys Val  
 1845 1850 1855  
 Ile Gln Leu Ser Arg Lys Thr Phe Asp Thr Glu Tyr Pro Lys Thr Lys  
 1860 1865 1870  
 Leu Thr Asp Trp Asp Phe Val Val Thr Thr Asp Ile Ser Glu Met Gly  
 1875 1880 1885  
 Ala Asn Phe Arg Ala Gly Arg Val Ile Asp Pro Arg Arg Cys Leu Lys  
 1890 1895 1900  
 Pro Val Ile Leu Pro Asp Gly Pro Glu Arg Val Ile Leu Ala Gly Pro  
 1905 1910 1915 1920  
 Ile Pro Val Thr Pro Ala Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly  
 1925 1930 1935  
 Arg Asn Pro Ala Gln Glu Asp Asp Gln Tyr Val Phe Ser Gly Asp Pro  
 1940 1945 1950  
 Leu Lys Asn Asp Glu Asp His Ala His Trp Thr Glu Ala Lys Met Leu  
 1955 1960 1965  
 Leu Asp Asn Ile Tyr Thr Pro Glu Gly Ile Ile Pro Thr Leu Phe Gly  
 1970 1975 1980  
 Pro Glu Arg Glu Lys Thr Gln Ala Ile Asp Gly Glu Phe Arg Leu Arg  
 1985 1990 1995 2000  
 Gly Glu Gln Arg Lys Thr Phe Val Glu Leu Met Arg Arg Gly Asp Leu  
 2005 2010 2015  
 Pro Val Trp Leu Ser Tyr Lys Val Ala Ser Ala Gly Ile Ser Tyr Lys  
 2020 2025 2030  
 Asp Arg Glu Trp Cys Phe Thr Gly Glu Arg Asn Asn Gln Ile Leu Glu  
 2035 2040 2045  
 Glu Asn Met Glu Val Glu Ile Trp Thr Arg Glu Gly Glu Lys Lys Lys  
 2050 2055 2060  
 Leu Arg Pro Arg Trp Leu Asp Ala Arg Val Tyr Ala Asp Pro Met Ala  
 2065 2070 2075 2080  
 Leu Lys Asp Phe Lys Glu Phe Ala Ser Gly Arg Lys Ser Ile Thr Leu  
 2085 2090 2095  
 Asp Ile Leu Thr Glu Ile Ala Ser Leu Pro Thr Tyr Leu Ser Ser Arg  
 2100 2105 2110  
 Ala Lys Leu Ala Leu Asp Asn Ile Val Met Leu His Thr Thr Glu Arg  
 2115 2120 2125  
 Gly Gly Arg Ala Tyr Gln His Ala Leu Asn Glu Leu Pro Glu Ser Leu  
 2130 2135 2140  
 Glu Thr Leu Met Leu Val Ala Leu Leu Gly Ala Met Thr Ala Gly Ile  
 2145 2150 2155 2160  
 Phe Leu Phe Phe Met Gln Gly Lys Gly Ile Gly Lys Leu Ser Met Gly

2165																2170				2175			
Leu	Ile	Thr	Ile	Ala	Val	Ala	Ser	Gly	Leu	Leu	Trp	Val	Ala	Glu	Ile								
			2180				2185						2190										
Gln	Pro	Gln	Trp	Ile	Ala	Ala	Ser	Ile	Ile	Leu	Glu	Phe	Phe	Leu	Met								
			2195				2200						2205										
Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp	Asn								
			2210				2215						2220										
Gln	Leu	Ile	Tyr	Val	Ile	Leu	Thr	Ile	Leu	Thr	Ile	Ile	Gly	Leu	Ile								
			2225				2230						2235										
Ala	Ala	Asn	Glu	Met	Gly	Leu	Ile	Glu	Lys	Thr	Lys	Thr	Asp	Phe	Gly								
			2245				2250						2255										
Phe	Tyr	Gln	Val	Lys	Thr	Glu	Thr	Thr	Ile	Leu	Asp	Val	Asp	Leu	Arg								
			2260				2265						2270										
Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr	Ala	Val	Ala	Thr	Thr	Ile	Leu	Thr								
			2275				2280						2285										
Pro	Met	Leu	Arg	His	Thr	Ile	Glu	Asn	Thr	Ser	Ala	Asn	Leu	Ser	Leu								
			2290				2295						2300										
Ala	Ala	Ile	Ala	Asn	Gln	Ala	Ala	Val	Leu	Met	Gly	Leu	Gly	Lys	Gly								
			2305				2310						2315										
Trp	Pro	Leu	His	Arg	Met	Asp	Leu	Gly	Val	Pro	Leu	Leu	Ala	Met	Gly								
			2325				2330						2335										
Cys	Tyr	Ser	Gln	Val	Asn	Pro	Thr	Thr	Leu	Thr	Ala	Ser	Leu	Val	Met								
			2340				2345						2350										
Leu	Leu	Val	His	Tyr	Ala	Ile	Ile	Gly	Pro	Gly	Leu	Gln	Ala	Lys	Ala								
			2355				2360						2365										
Thr	Arg	Glu	Ala	Gln	Lys	Arg	Thr	Ala	Ala	Gly	Ile	Met	Lys	Asn	Pro								
			2370				2375						2380										
Thr	Val	Asp	Gly	Ile	Thr	Val	Ile	Asp	Leu	Glu	Pro	Ile	Ser	Tyr	Asp								
			2385				2390						2395										
Pro	Lys	Phe	Glu	Lys	Gln	Leu	Gly	Gln	Val	Met	Leu	Leu	Val	Leu	Cys								
			2405				2410						2415										
Ala	Gly	Gln	Leu	Leu	Leu	Met	Arg	Thr	Thr	Trp	Ala	Phe	Cys	Glu	Val								
			2420				2425						2430										
Leu	Thr	Leu	Ala	Thr	Gly	Pro	Ile	Leu	Thr	Leu	Trp	Glu	Gly	Asn	Pro								
			2435				2440						2445										
Gly	Arg	Phe	Trp	Asn	Thr	Thr	Ile	Ala	Val	Ser	Thr	Ala	Asn	Ile	Phe								
			2450				2455						2460										
Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Gly	Leu	Ala	Phe	Ser	Leu	Ile	Lys								
			2465				2470						2475										
Asn	Ala	Gln	Thr	Pro	Arg	Arg	Gly	Thr	Gly	Thr	Thr	Gly	Glu	Thr	Leu								
			2485				2490						2495										
Gly	Glu	Lys	Trp	Lys	Arg	Gln	Leu	Asn	Ser	Leu	Asp	Arg	Lys	Glu	Phe								
			2500				2505						2510										
Glu	Glu	Tyr	Lys	Arg	Ser	Gly	Ile	Leu	Glu	Val	Asp	Arg	Thr	Glu	Ala								
			2515				2520						2525										
Lys	Ser	Ala	Leu	Lys	Asp	Gly	Ser	Lys	Ile	Lys	His	Ala	Val	Ser	Arg								
			2530				2535						2540										
Gly	Ser	Ser	Lys	Ile	Arg	Trp	Ile	Val	Glu	Arg	Gly	Met	Val	Lys	Pro								
			2545				2550						2555										
Lys	Gly	Lys	Val	Val	Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr								
			2565				2570																

Pro Trp Leu Ser Ser Lys Pro Glu Phe Cys Ile Lys Val Leu Asn Pro  
 Tyr Met Pro Thr Val Ile Glu Glu Leu Glu Lys Leu Gln Arg Lys His  
 Gly Gly Asn Leu Val Arg Cys Pro Leu Ser Arg Asn Ser Thr His Glu  
 Met Tyr Trp Val Ser Gly Ala Ser Gly Asn Ile Val Ser Ser Val Asn  
 Thr Thr Ser Lys Met Leu Leu Asn Arg Phe Thr Thr Arg His Arg Lys  
 Pro Thr Tyr Glu Lys Asp Val Asp Leu Gly Ala Gly Thr Arg Ser Val  
 Ser Thr Glu Thr Glu Lys Pro Asp Met Thr Ile Ile Gly Arg Arg Leu  
 Gln Arg Leu Gln Glu Glu His Lys Glu Thr Trp His Tyr Asp Gln Glu  
 Asn Pro Tyr Arg Thr Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Ser  
 Thr Gly Ser Ala Ser Ser Met Val Asn Gly Val Val Lys Leu Leu Thr  
 Lys Pro Trp Asp Val Ile Pro Met Val Thr Gln Leu Ala Met Thr Asp  
 Thr Thr Pro Phe Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr  
 Arg Thr Pro Gln Pro Lys Pro Gly Thr Arg Met Val Met Thr Thr Thr  
 Ala Asn Trp Leu Trp Ala Leu Leu Gly Lys Lys Lys Asn Pro Arg Leu  
 Cys Thr Arg Glu Glu Phe Ile Ser Lys Val Arg Ser Asn Ala Ala Ile  
 Gly Ala Val Phe Gln Glu Glu Gln Gly Trp Thr Ser Ala Ser Glu Ala  
 Val Asn Asp Ser Arg Phe Trp Glu Leu Val Asp Lys Glu Arg Ala Leu  
 His Gln Glu Gly Lys Cys Glu Ser Cys Val Tyr Asn Met Met Gly Lys  
 Arg Glu Lys Lys Leu Gly Glu Phe Gly Arg Ala Lys Gly Ser Arg Ala  
 Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu Glu Phe Glu Ala Leu  
 Gly Phe Leu Asn Glu Asp His Trp Phe Gly Arg Glu Asn Ser Trp Ser  
 Gly Val Glu Gly Glu Gly Leu His Arg Leu Gly Tyr Ile Leu Glu Glu  
 Ile Asp Lys Lys Asp Gly Asp Leu Met Tyr Ala Asp Thr Ala Gly  
 Trp Asp Thr Arg Ile Thr Glu Asp Asp Leu Gln Asn Glu Glu Leu Ile  
 Thr Glu Gln Met Ala Pro His His Lys Ile Leu Ala Lys Ala Ile Phe  
 Lys Leu Thr Tyr Gln Asn Lys Val Val Lys Val Leu Arg Pro Thr Pro  
 Arg Gly Ala Val Met Asp Ile Ile Ser Arg Lys Asp Gln Arg Gly Ser  
 Gly Gln Val Gly Thr Tyr Gly Leu Asn Thr Phe Thr Asn Met Glu Val  
 Gln Leu Ile Arg Gln Met Glu Ala Glu Gly Val Ile Thr Gln Asp Asp  
 Met Gln Asn Pro Lys Gly Leu Lys Glu Arg Val Glu Lys Trp Leu Lys  
 Glu Cys Gly Val Asp Arg Leu Lys Arg Met Ala Ile Ser Gly Asp Asp

	3140		3145		3150
Cys Val Val Lys Pro Leu Asp Glu Arg Phe Gly Thr Ser Leu Leu Phe					
	3155		3160		3165
Leu Asn Asp Met Gly Lys Val Arg Lys Asp Ile Pro Gln Trp Glu Pro					
	3170		3175		3180
Ser Lys Gly Trp Lys Asn Trp Gln Glu Val Pro Phe Cys Ser His His					
3185		3190		3195	3200
Phe His Lys Ile Phe Met Lys Asp Gly Arg Ser Leu Val Val Pro Cys					
	3205		3210		3215
Arg Asn Gln Asp Glu Leu Ile Gly Arg Ala Arg Ile Ser Gln Gly Ala					
	3220		3225		3230
Gly Trp Ser Leu Arg Glu Thr Ala Cys Leu Gly Lys Ala Tyr Ala Gln					
	3235		3240		3245
Met Trp Ser Leu Met Tyr Phe His Arg Arg Asp Leu Arg Leu Ala Ser					
	3250		3255		3260
Met Ala Ile Cys Ser Ala Val Pro Thr Glu Trp Phe Pro Thr Ser Arg					
3265		3270		3275	3280
Thr Thr Trp Ser Ile His Ala His His Gln Trp Met Thr Thr Glu Asp					
	3285		3290		3295
Met Leu Lys Val Trp Asn Arg Val Trp Ile Glu Asp Asn Pro Asn Met					
	3300		3305		3310
Thr Asp Lys Thr Pro Val His Ser Trp Glu Asp Ile Pro Tyr Leu Gly					
	3315		3320		3325
Lys Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly Leu Ser Ser Arg					
	3330		3335		3340
Ala Thr Trp Ala Lys Asn Ile His Thr Ala Ile Thr Gln Val Arg Asn					
3345		3350		3355	3360
Leu Ile Gly Lys Glu Tyr Val Asp Tyr Met Pro Val Met Lys Arg					
	3365		3370		3375
Tyr Ser Ala Pro Ser Glu Ser Glu Gly Val Leu					
	3380		3385		

<210> 14

<211> 10649

<212> DNA

<213> Dengue 4 virus strain 2A

<400> 14

agttgttagt	ctgtgtggac	cgacaaggac	agttccaaat	cggaagcttg	cttaacacag	60
ttctaacagt	ttgtttgaat	agagagcaga	tctctggaaa	aatgaaccaa	cgaaaaaagg	120
tggttagacc	acctttcaat	atgctgaaac	gcgagagaaa	ccgcgtatca	accctcaag	180
ggttggtgaa	gagattctca	accggacttt	tttctgggaa	aggaccctta	cggatggtgc	240
tagcattcat	cacgtttttg	cgagtccttt	ccatcccacc	aacagcaggg	attctgaaga	300
gatggggaca	gttgaagaaa	aataaggcca	tcaagatact	gattggattc	aggaaggaga	360
taggccgcat	gctgaacatc	ttgaacggga	gaaaaaggtc	aacgataaca	ttgctgtgct	420
tgattcccac	cgtaattggc	ttttccttgt	caacaagaga	tggcgaaccc	ctcatgatag	480
tggcaaaaca	tgaaagggg	agacctctct	tgtttaagac	aacagagggg	atcaacaaat	540
gcactctcat	tgccatggac	ttgggtgaaa	tgtgtgagga	cactgtcacg	tataaatgcc	600
ccctactggg	caataccgaa	cctgaagaca	ttgattgctg	gtgcaacctc	acgtctacct	660
gggtcatgta	tgggacatgc	acccagagcg	gagaacggag	acgagagaag	cgctcagtag	720
ctttaacacc	acattcagga	atgggatttg	aaacaagagc	tgagacatgg	atgtcatcgg	780
aaggggcttg	gaagcatgct	cagagagtag	agagctggat	actcagaaac	ccaggattcg	840
cgctcttggc	aggatttatg	gcttatatga	ttgggcaaac	aggaatccag	cgaactgtct	900
tctttgtcct	aatgatgctg	gtcgcccat	cctacggaat	gcgatgcgta	ggagtaggaa	960
acagagactt	tgtggaagga	gtctcagggt	gagcatgggt	cgacctgggt	ctagaacatg	1020
gaggatgcgt	cacaaccatg	gcccagggaa	aaccaacctt	ggattttgaa	ctgactaaga	1080
caacagccaa	ggaagtggct	ctgttaagaa	cctattgcat	tgaagcctca	atatcaaa	1140
taactacggc	aacaagatgt	ccaacgcaag	gagagcctta	tctgaaagag	gaacaggacc	1200
aacagtacat	ttgccggaga	gatgtggtag	acagagggtg	gggcaatggc	tgtggcttgt	1260
ttggaaaagg	aggagtgtgt	acatgtgcga	agttttcatg	ttcggggaag	ataacaggca	1320

atttgggtcca	aattgagaac	cttgaataca	cagtgggtgt	aacagtccac	aatggagaca	1380
cccatgcagt	aggaaatgac	acatccaatc	atggagttac	agccatgata	actcccaggt	1440
caccatcggg	ggaagtcaaa	ttgccggact	atggagaact	aacactcgat	tgtgaacca	1500
ggtctggaat	tgactttaat	gagatgattc	tgatgaaaat	gaaaaagaaa	acatggctcg	1560
tgcataagca	atgggttttg	gatctgcctc	ttccatggac	agcaggagca	gacacatcag	1620
aggttcactg	gaattacaaa	gagagaatgg	tgacatttaa	ggttcctcat	gccaagagac	1680
aggatgtgac	agtgtctgga	tctcaggaag	gagccatgca	ttctgccctc	gctggagcca	1740
cagaagtgga	ctccggtgat	ggaaatcaca	tgtttgagg	acatcttaag	tgcaaagtcc	1800
gtatggagaa	attgagaatc	aagggaatgt	catacacgat	gtgttcagga	aagttttcaa	1860
ttgacaaaaga	gatggcagaa	acacagcatg	ggacaacagt	ggtgaaagtc	aagtatgaag	1920
gtgctggagc	tccgtgtaaa	gtccccatag	agataagaga	tgtaaacaag	gaaaaagtg	1980
ttgggcgtat	catctcatcc	accccttttg	ctgagaatac	caacagtgt	accaacatag	2040
aattagaacc	cccctttggg	gacagctaca	tagtgatagg	tggttgaaac	agcgcattaa	2100
cactccattg	gttcaggaaa	gggagttcca	ttggcaagat	gtttgagtc	acatacagag	2160
gtgcaaaacg	aattggccatt	ctaggtgaaa	cagcttgga	ttttggttcc	gttgggtggac	2220
tgttcacatc	attgggaaag	gctgtgcacc	agggtttttg	aagtgtgtat	acaaccatgt	2280
ttggaggagt	ctcatggatg	attagaatcc	taattgggtt	cttagtgttg	tggattggca	2340
cgaactcaag	gaacacttca	atggctatga	cgtgcatagc	tggttgagga	atcactctgt	2400
ttctgggctt	cacagttcaa	gcagacatgg	gttgtgtggt	gtcatggagt	gggaaagaat	2460
tgaagtgtgg	aagcggaatt	tttgtggttg	acaacgtgca	cacttgga	gaacagtaca	2520
aatttcaacc	agagtcccca	gcgagactag	cgtctgcaat	attaaatgcc	cacaaagatg	2580
gggtctgtgg	aattagatca	accacgaggc	tggaaaatgt	catgtggaag	caaataacca	2640
acgagctaaa	ctatgttctc	tgggaaggag	gacatgacct	cactgtagt	gctggggatg	2700
tgaaggggt	gttgacaaa	ggcaagagag	cactcacacc	cccagttagt	gatctgaaat	2760
attcatggaa	gacatgggga	aaagcaaaaa	tcttcacccc	agaagcaaga	aatagcacat	2820
ttttaataga	cggaccagac	acctctgaat	gccccaatga	acgaagagca	tggaactctc	2880
ttgaggtgga	agactatgga	tttggcatgt	tcacgaccaa	catatggatg	aaattccgag	2940
aagggaagttc	agaagtgtgt	gaccacaggt	taatgtcagc	tgcaattaaa	gatcagaaa	3000
ctgtgcatgc	tgacatgggt	tattggatag	agagctcaaa	aaaccagacc	tggcagatag	3060
agaaagcatc	tcttattgaa	gtgaaaacat	gtctgtggcc	caagaccac	acactgtgga	3120
gcaatggagt	gctggaagc	cagatgctca	ttccaaaatc	atatgcgggc	cctttttcac	3180
agcacaaat	ccgacaggc	tatgccacgc	aaaccgtggg	cccatggcac	ttaggcaaat	3240
tagagataga	ctttggagaa	tgccccggaa	caacagtcac	aattcaggag	gattgtgacc	3300
atagaggccc	atctttgagg	accaccactg	catctggaaa	actagtacg	caatggtgct	3360
gccgctcctg	cacgatgcct	cccttaaggt	tcttgggaga	agatgggtgc	tggatggga	3420
tggagattag	gcccttgagt	gaaaaagaag	agaacatggt	caaatcacag	gtgacggccg	3480
gacagggcac	atcagaaact	ttttctatgg	gtctgttgtg	cctgaccttg	tttgtggaag	3540
aatgcttgag	gagaagagtc	actaggaac	acatgatatt	agttgtggtg	atcactcttt	3600
gtgctaatc	cctgggaggc	ctcacatgga	tggacttact	acgagccctc	atcatgttgg	3660
gggacactat	gtctggtaga	ataggaggac	agatccacct	agccatcatg	gcagtgttca	3720
agatgtcacc	aggatacgtg	ctgggtgtgt	ttttaaggaa	actcacttca	agagagacag	3780
cactaatggt	aataggaatg	gccatgacaa	cgggtgctttc	aattccacat	gaccttatgg	3840
aactcattga	tggaatatca	ctgggactaa	ttttgctaaa	aatagtaaca	cagtttgaca	3900
acaccaagt	gggaacctta	gctctttcct	tgactttcat	aagatcaaca	atgccattgg	3960
tcatggcttg	gaggaccatt	atggctgtgt	tgtttgtggt	cacactcatt	cctttgtgca	4020
ggacaagctg	tcttcaaaaa	cagtctcatt	gggtagaaat	aacagcactc	atcctaggag	4080
cccaagctct	gccagtgtac	ctaagtactc	ttatgaaagg	agcctcaaga	agatcttggc	4140
ctcttaacga	gggcataatg	gctgtgggtt	tggttagtct	cttaggaagc	gctcttttaa	4200
agaatgatgt	cccttttagct	ggcccaatgg	tggcaggagg	cttacttctg	gcggttacg	4260
tgatgagtgg	tagctcagca	gatctgtcac	tagagaaggc	cgccaacgtg	cagtgggatg	4320
aaatggcaga	cataacaggc	tcaagcccaa	tcatagaagt	gaagcaggat	gaagatggct	4380
ctttctccat	acgggacgtc	gaggaaacca	atatgataac	ccttttggtg	aaactggcac	4440
tgataacagt	gtcaggtctc	taccctttgg	caattccagt	cacaatgacc	ttatggtaca	4500
tgtggcaagt	gaaaacacaa	agatcaggag	ccctgtggga	cgtcccctca	cccgctgcca	4560
ctaaaaaagc	cgcactgtct	gaaggagtgt	acaggatcat	gcaaagaggg	ttattcgga	4620
aaactcaggt	tggagtggg	atacacatgt	aaggtgtatt	tcacacaatg	tggcatgtaa	4680
caagaggatg	agtgatctgc	cacgagactg	ggagattgga	gccatcttgg	gctgacgtca	4740
ggaatgacat	gatatacatc	ggtgggggat	ggaggcttgg	agacaaatgg	gacaaagaag	4800
aagacgttca	ggtcctcgcc	atagaaccag	gaaaaaatcc	taaacatgtc	caaacgaaac	4860
ctggcctttt	caagacccta	actggagaaa	ttggagcagt	aacattagat	ttcaaaccg	4920
gaacgtctgg	ttctcccatc	atcaacagga	aaggaaaagt	catcgactc	tatggaaatg	4980

gagtagttac	caaatcaggt	gattacgtca	gtgccataac	gcaagccgaa	agaattggag	5040
agccagatta	tgaagtggat	gaggacattt	ttcgaaagaa	aagattaact	ataatggact	5100
tacaccccg	agctggaag	acaaaaagaa	ttcttccatc	aatagtgaga	gaagccttaa	5160
aaaggaggct	acgaactttg	atttttagctc	ccacgagagt	ggtggcgcc	gagatggaag	5220
aggccctacg	tggactgcca	atccgttatc	agacccagc	tgtgaaatca	gaacacacag	5280
gaagagagat	tgtagacctc	atgtgtcatg	caaccttcac	aacaagactt	ttgtcatcaa	5340
ccagggttcc	aaattacaac	cttatagtga	tggatgaagc	acatttcacc	gaccttcta	5400
gtgtcgcggc	tagaggatac	atctcgacca	gggtggaaat	gggagaggca	gcagccatct	5460
tcatgaccgc	aaccctccc	ggagcgacag	atccctttcc	ccagagcaac	agcccaatag	5520
aagacatcga	gagggaaatt	ccggaaaggt	catggaacac	agggttcgac	tggataacag	5580
actaccaagg	gaaaactgtg	tggtttgttc	ccagcataaa	agctggaaat	gacattgcaa	5640
attgttttag	aaagtcggga	aagaaagtta	tccagttgag	taggaaaacc	tttgatacag	5700
agtatccaaa	aacgaaactc	acggactggg	acttttgtgt	cactacagac	atatctgaaa	5760
tgggggccaa	tttttagagcc	gggagagtga	tagaccctag	aagatgcctc	aagccagtta	5820
tcctaccaga	tgggccagag	agagtcattt	tagcaggtcc	tattccagtg	actccagcaa	5880
gcgctgctca	gagaagaggg	cgaataggaa	ggaaccagc	acaagaagac	gaccaatacg	5940
ttttctccgg	agacccacta	aaaaatgatg	aagatcatgc	ccactggaca	gaagcaaaga	6000
tgctgcttga	caatatctac	accccagaag	ggatcattcc	aacattgttt	ggtccggaag	6060
gggaaaaaac	ccaagccatt	gatggagagt	ttcgctcag	aggggaacaa	aggaagactt	6120
ttgtggaatt	aatgaggaga	ggagaccttc	cgggtgtggc	gagctataag	gtagcttctg	6180
ctggcatttc	ttacaaagat	cgggaatggt	gcttcacagg	ggaaagaaat	aaccaaattt	6240
tagaagaaaa	catggaggtt	gaaatttgga	ctagagaggg	agaaaagaaa	aagctaaggc	6300
caagatgggt	agatgcacgt	gtatacgtg	accccatggc	tttgaaggat	ttcaaggagt	6360
ttgccagtgg	aaggaagagt	ataactctcg	acatcctaac	agagattgcc	agtttgccaa	6420
cttacctttc	ctctagggcc	aagctcgccc	ttgataacat	agtcattgctc	cacacaacag	6480
aaagaggagg	gagggcctat	caacacgccc	tgaacgaact	tccggagtca	ctggaacac	6540
tcatgcttgt	agctttacta	ggtgctatga	cagcaggcat	cttcctgttt	ttcatgcaag	6600
ggaaaggaat	agggaaattg	tcaatgggtt	tgataaccat	tgcggtggct	agtggcttgc	6660
tctgggtagc	agaaattcaa	ccccagtggg	tagcggcctc	aatcatacta	gagttttttc	6720
tcatggtact	gttgataccg	gaaccagaaa	aacaaggac	cccacaagac	aatcaattga	6780
tctacgtcat	attgaccatt	ctcaccatca	ttggtcta	agcagccaac	gagatggggc	6840
tgattgaaaa	aacaaaaacg	gattttgggt	tttaccaggt	aaaaacagaa	accaccatcc	6900
tcgatgtgga	cttgagacca	gcttcagcat	ggacgctcta	tgcatgagcc	accacaattc	6960
tgactcccat	gctgagacac	accatagaaa	acacgtcggc	caacctatct	ctagcagcca	7020
ttgccaacca	ggcagccgtc	ctaattggggc	ttggaaaagg	atggccgctc	cacagaatgg	7080
acctcggtgt	gccgctgtta	gcaatgggat	gctattctca	agtgaaccca	acaaccttga	7140
cagcatcctt	agtcattgctt	ttagtcattt	atgcaataat	aggcccagga	ttgcaggcaa	7200
aagccacaag	agaggcccag	aaaaggacag	ctgctgggat	catgaaaaat	cccacagtgg	7260
acgggataac	agtaatatag	ctagaaccaa	tatcctatga	cccaaaattt	gaaaagcaat	7320
tagggcaggt	catgctacta	gtcttgtgtg	ctggacaact	actcttgatg	agaacaacat	7380
gggctttctg	tgaagtcttg	actttggcca	caggaccaat	cttgaccttg	tgggagggca	7440
acccgggaag	gtttttggaac	acgaccatag	ccgtatccac	cgccaacatt	ttcaggggaa	7500
gttacttggc	gggagctgga	ctggcttttt	cactcataaa	gaatgcacaa	acccctagga	7560
ggggaactgg	gaccacagga	gagacactgg	gagagaagtg	gaagagacag	ctaaactcat	7620
tagacagaaa	agagtttgaa	gagtataaaa	gaagtggaa	actagaagtg	gacaggactg	7680
aagccaagtc	tgccctgaaa	gatgggtcta	aaatcaagca	tgcatgatct	agagggtcca	7740
gtaagatcag	atggattgtt	gagagagggg	tggtaaagcc	aaaagggaaa	gttgtagatc	7800
ttggctgtgg	gagaggagga	tggctttatt	acatggcgac	actcaagaac	gtgactgaag	7860
tgaaagggta	tacaaaagga	ggtccaggac	atgaagaacc	gattcccatg	gctacttatg	7920
gttggaattt	ggtcaaaactc	cattcagggg	ttgacgtgtt	ctacaaaccc	acagagcaag	7980
tggacaccct	gctctgtgat	attggggagt	catcttctaa	tccaacaata	gaggaaggaa	8040
gaacattaag	agttttgaag	atgggtggagc	catggctctc	ttcaaaacct	gaattctgca	8100
tcaaagtcct	taacccttac	atgccaacag	tcatagaaga	gctggagaaa	ctgcagagaa	8160
aacatggtgg	gaaccttgtc	agatgcccgc	tgtccaggaa	ctccacccat	gagatgtatt	8220
gggtgtcagg	agcgtcggga	aacatttgtga	gctctgtgaa	cacaacatca	aagatgttgt	8280
tgaacaggtt	cacaacaagg	cataggaaac	ccactttatga	gaaggacgta	gatcttgggt	8340
caggaacgag	aagtgtctcc	actgaaacag	aaaaaccaga	catgacaatc	attgggagaa	8400
ggcttcagcg	attgcaagaa	gagcacaag	aaacctggca	ttatgatcag	gaaaacccat	8460
acagaacctg	ggcgtatcat	ggaagctatg	aagctccttc	gacaggctct	gcacctcca	8520
tgggtgaacgg	ggtggtaaaa	ctgctaacaa	aacctgggga	tgtgattcca	atgggtgactc	8580
agttagccat	gacagataca	accccttttg	ggcaacaaag	agtgttcaaa	gagaaggtgg	8640

ataccagaac	accacaacca	aaacccggta	cacgaatggt	tatgaccacg	acagccaatt	8700
ggctgtgggc	cctccttgga	aagaagaaaa	atcccagact	gtgcacaagg	gaagagttca	8760
tctcaaaagt	tagatcaaac	gcagccatag	gcgcagtctt	tcaggaagaa	cagggatgga	8820
catcagccag	tgaagctgtg	aatgacagcc	ggttttggga	actggttgac	aaagaaaggg	8880
ccctacacca	ggaagggaaa	tgtgaatcgt	gtgtctataa	catgatggga	aaacgtgaga	8940
aaaagttagg	agagtttggc	agagccaagg	gaagccgagc	aatctggtac	atgtggctgg	9000
gagcgcggtt	tctggaattt	gaagccctgg	gttttttgaa	tgaagatcac	tggtttgga	9060
gagaaaattc	atggagtggg	gtggaagggg	aaggtctgca	cagattggga	tatatcctgg	9120
aggagataga	caagaaggat	ggagacctaa	tgtatgctga	tgacacagca	ggctgggaca	9180
caagaatcac	tgaggatgac	cttcaaaatg	aggaactgat	cacggaacag	atggctcccc	9240
accacaagat	cctagccaaa	gccattttca	aactaaccta	tcaaaacaaa	gtggtgaaag	9300
tcctcagacc	cacaccgaga	ggagcgggtg	tggatatcat	atccaggaaa	gaccaaagag	9360
gtagtggaca	agttggaaca	tatggtttga	acacattcac	caacatggaa	gttcaactca	9420
tccgccaaat	ggaagctgaa	ggagtcacat	cacaagatga	catgcagaac	ccaaaagggg	9480
tgaagaaaag	agttgagaaa	tggctgaaa	agtgtggtgt	cgacagggtta	aagaggatgg	9540
caatcagtgg	agacgattgc	gtggtgaagc	ccctagatga	gaggtttggc	acttccctcc	9600
tcttcttgaa	cgacatggga	aaggtgagga	aagacattcc	gcagtgggaa	ccatctaagg	9660
gatggaaaaa	ctggcaagag	gttccttttt	gctcccacca	ctttcacaag	atctttatga	9720
aggatggccg	ctcactagtt	gttccatgta	gaaaccagga	tgaactgata	gggagagcca	9780
gaatctcgca	gggagctgga	tggagcttaa	gagaaacagc	ctgcctgggc	aaagcttacg	9840
cccagatgtg	gtcgtttatg	tacttccaca	gaagggatct	gcgtttagcc	tccatggcca	9900
tatgctcagc	agttccaacg	gaatggtttc	caacaagcag	aacaacatgg	tcaatccacg	9960
ctcatcacca	gtggatgacc	actgaagata	tgctcaaagt	gtggaacaga	gtgtggatag	10020
aagacaaccc	taatatgact	gacaagactc	cagtccattc	gtgggaagat	ataccttacc	10080
tagggaaaag	agaggatttg	tgggtgtggat	ccctgattgg	actttcttcc	agagccacct	10140
gggcgaagaa	cattcacacg	gccataaccc	aggtcaggaa	cctgatcgga	aaagagggaat	10200
acgtggatta	catgccagta	atgaaaagat	acagtgtctc	ttcagagagt	gaaggagttc	10260
tgtaattacc	aacaacaaac	accaaaggct	attgaagtca	ggccacttgt	gccacggttt	10320
gagcaaaccg	tgctgcctgt	agctccgcca	ataatgggag	gcgtaataat	ccccaggagg	10380
gccatgcgcc	acggaagctg	tacgcgtggc	atatgggact	agcggttaga	ggagaccctt	10440
cccactcactg	acaaaacgca	gcaaaaaggg	gcccgaagcc	aggaggaagc	tgtactcctg	10500
gtggaaggac	tagaggtttag	aggagacccc	cccaacacaa	aaacagcata	ttgacgctgg	10560
gaaagaccag	agatcctgct	gtctctgcaa	catcaatcca	ggcacagagc	gccgcaagat	10620
ggattggtgt	tgttgatcca	acaggtttct				10649

<210> 15

<211> 3387

<212> PRT

<213> Recombinant Dengue 4 virus strain rDEN4

<400> 15

Met	Asn	Gln	Arg	Lys	Lys	Val	Val	Arg	Pro	Pro	Phe	Asn	Met	Leu	Lys
1				5					10					15	
Arg	Glu	Arg	Asn	Arg	Val	Ser	Thr	Pro	Gln	Gly	Leu	Val	Lys	Arg	Phe
			20					25					30		
Ser	Thr	Gly	Leu	Phe	Ser	Gly	Lys	Gly	Pro	Leu	Arg	Met	Val	Leu	Ala
		35					40					45			
Phe	Ile	Thr	Phe	Leu	Arg	Val	Leu	Ser	Ile	Pro	Pro	Thr	Ala	Gly	Ile
	50					55				60					
Leu	Lys	Arg	Trp	Gly	Gln	Leu	Lys	Lys	Asn	Lys	Ala	Ile	Lys	Ile	Leu
65					70				75					80	
Ile	Gly	Phe	Arg	Lys	Glu	Ile	Gly	Arg	Met	Leu	Asn	Ile	Leu	Asn	Gly
				85				90					95		
Arg	Lys	Arg	Ser	Thr	Ile	Thr	Leu	Leu	Cys	Leu	Ile	Pro	Thr	Val	Met
			100					105					110		
Ala	Phe	Ser	Leu	Ser	Thr	Arg	Asp	Gly	Glu	Pro	Leu	Met	Ile	Val	Ala
		115					120					125			
Lys	His	Glu	Arg	Gly	Arg	Pro	Leu	Leu	Phe	Lys	Thr	Thr	Glu	Gly	Ile
	130					135					140				
Asn	Lys	Cys	Thr	Leu	Ile	Ala	Met	Asp	Leu	Gly	Glu	Met	Cys	Glu	Asp
145					150					155					160

Thr	Val	Thr	Tyr	Lys	Cys	Pro	Leu	Leu	Val	Asn	Thr	Glu	Pro	Glu	Asp
				165					170					175	
Ile	Asp	Cys	Trp	Cys	Asn	Leu	Thr	Ser	Thr	Trp	Val	Met	Tyr	Gly	Thr
			180					185					190		
Cys	Thr	Gln	Ser	Gly	Glu	Arg	Arg	Glu	Lys	Arg	Ser	Val	Ala	Leu	
		195					200				205				
Thr	Pro	His	Ser	Gly	Met	Gly	Leu	Glu	Thr	Arg	Ala	Glu	Thr	Trp	Met
	210					215					220				
Ser	Ser	Glu	Gly	Ala	Trp	Lys	His	Ala	Gln	Arg	Val	Glu	Ser	Trp	Ile
	225				230					235					240
Leu	Arg	Asn	Pro	Gly	Phe	Ala	Leu	Leu	Ala	Gly	Phe	Met	Ala	Tyr	Met
				245					250					255	
Ile	Gly	Gln	Thr	Gly	Ile	Gln	Arg	Thr	Val	Phe	Phe	Val	Leu	Met	Met
			260					265					270		
Leu	Val	Ala	Pro	Ser	Tyr	Gly	Met	Arg	Cys	Val	Gly	Val	Gly	Asn	Arg
		275					280					285			
Asp	Phe	Val	Glu	Gly	Val	Ser	Gly	Gly	Ala	Trp	Val	Asp	Leu	Val	Leu
	290					295					300				
Glu	His	Gly	Gly	Cys	Val	Thr	Thr	Met	Ala	Gln	Gly	Lys	Pro	Thr	Leu
	305				310					315					320
Asp	Phe	Glu	Leu	Thr	Lys	Thr	Thr	Ala	Lys	Glu	Val	Ala	Leu	Leu	Arg
				325					330					335	
Thr	Tyr	Cys	Ile	Glu	Ala	Ser	Ile	Ser	Asn	Ile	Thr	Thr	Ala	Thr	Arg
			340					345					350		
Cys	Pro	Thr	Gln	Gly	Glu	Pro	Tyr	Leu	Lys	Glu	Glu	Gln	Asp	Gln	Gln
		355					360					365			
Tyr	Ile	Cys	Arg	Arg	Asp	Val	Val	Asp	Arg	Gly	Trp	Gly	Asn	Gly	Cys
	370				375						380				
Gly	Leu	Phe	Gly	Lys	Gly	Gly	Val	Val	Thr	Cys	Ala	Lys	Phe	Ser	Cys
	385				390					395					400
Ser	Gly	Lys	Ile	Thr	Gly	Asn	Leu	Val	Gln	Ile	Glu	Asn	Leu	Glu	Tyr
			405						410					415	
Thr	Val	Val	Val	Thr	Val	His	Asn	Gly	Asp	Thr	His	Ala	Val	Gly	Asn
			420					425					430		
Asp	Thr	Ser	Asn	His	Gly	Val	Thr	Ala	Met	Ile	Thr	Pro	Arg	Ser	Pro
		435					440					445			
Ser	Val	Glu	Val	Lys	Leu	Pro	Asp	Tyr	Gly	Glu	Leu	Thr	Leu	Asp	Cys
	450					455					460				
Glu	Pro	Arg	Ser	Gly	Ile	Asp	Phe	Asn	Glu	Met	Ile	Leu	Met	Lys	Met
	465				470					475					480
Lys	Lys	Lys	Thr	Trp	Leu	Val	His	Lys	Gln	Trp	Phe	Leu	Asp	Leu	Pro
			485						490					495	
Leu	Pro	Trp	Thr	Ala	Gly	Ala	Asp	Thr	Ser	Glu	Val	His	Trp	Asn	Tyr
			500					505					510		
Lys	Glu	Arg	Met	Val	Thr	Phe	Lys	Val	Pro	His	Ala	Lys	Arg	Gln	Asp
		515					520					525			
Val	Thr	Val	Leu	Gly	Ser	Gln	Glu	Gly	Ala	Met	His	Ser	Ala	Leu	Ala
		530				535					540				
Gly	Ala	Thr	Glu	Val	Asp	Ser	Gly	Asp	Gly	Asn	His	Met	Phe	Ala	Gly
	545				550					555					560
His	Leu	Lys	Cys	Lys	Val	Arg	Met	Glu	Lys	Leu	Arg	Ile	Lys	Gly	Met
			565						570					575	
Ser	Tyr	Thr	Met	Cys	Ser	Gly	Lys	Phe	Ser	Ile	Asp	Lys	Glu	Met	Ala
			580					585					590		
Glu	Thr	Gln	His	Gly	Thr	Thr	Val	Lys	Val	Lys	Tyr	Glu	Gly	Ala	
		595					600					605			
Gly	Ala	Pro	Cys	Lys	Val	Pro	Ile	Glu	Ile	Arg	Asp	Val	Asn	Lys	Glu
	610					615					620				
Lys	Val	Val	Gly	Arg	Ile	Ile	Ser	Ser	Thr	Pro	Leu	Ala	Glu	Asn	Thr
	625				630					635					640
Asn	Ser	Val	Thr	Asn	Ile	Glu	Leu	Glu	Pro	Pro	Phe	Gly	Asp	Ser	Tyr



				645					650					655		
Ile	Val	Ile	Gly	Val	Gly	Asn	Ser	Ala	Leu	Thr	Leu	His	Trp	Phe	Arg	
			660					665					670			
Lys	Gly	Ser	Ser	Ile	Gly	Lys	Met	Phe	Glu	Ser	Thr	Tyr	Arg	Gly	Ala	
		675					680					685				
Lys	Arg	Met	Ala	Ile	Leu	Gly	Glu	Thr	Ala	Trp	Asp	Phe	Gly	Ser	Val	
	690					695					700					
Gly	Gly	Leu	Phe	Thr	Ser	Leu	Gly	Lys	Ala	Val	His	Gln	Val	Phe	Gly	
705					710					715					720	
Ser	Val	Tyr	Thr	Thr	Met	Phe	Gly	Gly	Val	Ser	Trp	Met	Ile	Arg	Ile	
				725					730					735		
Leu	Ile	Gly	Phe	Leu	Val	Leu	Trp	Ile	Gly	Thr	Asn	Ser	Arg	Asn	Thr	
			740					745					750			
Ser	Met	Ala	Met	Thr	Cys	Ile	Ala	Val	Gly	Gly	Ile	Thr	Leu	Phe	Leu	
		755					760					765				
Gly	Phe	Thr	Val	Gln	Ala	Asp	Met	Gly	Cys	Val	Ala	Ser	Trp	Ser	Gly	
	770					775					780					
Lys	Glu	Leu	Lys	Cys	Gly	Ser	Gly	Ile	Phe	Val	Val	Asp	Asn	Val	His	
785					790					795					800	
Thr	Trp	Thr	Glu	Gln	Tyr	Lys	Phe	Gln	Pro	Glu	Ser	Pro	Ala	Arg	Leu	
				805					810					815		
Ala	Ser	Ala	Ile	Leu	Asn	Ala	His	Lys	Asp	Gly	Val	Cys	Gly	Ile	Arg	
			820					825					830			
Ser	Thr	Thr	Arg	Leu	Glu	Asn	Val	Met	Trp	Lys	Gln	Ile	Thr	Asn	Glu	
		835					840					845				
Leu	Asn	Tyr	Val	Leu	Trp	Glu	Gly	Gly	His	Asp	Leu	Thr	Val	Val	Ala	
	850					855					860					
Gly	Asp	Val	Lys	Gly	Val	Leu	Thr	Lys	Gly	Lys	Arg	Ala	Leu	Thr	Pro	
865					870					875					880	
Pro	Val	Ser	Asp	Leu	Lys	Tyr	Ser	Trp	Lys	Thr	Trp	Gly	Lys	Ala	Lys	
				885					890					895		
Ile	Phe	Thr	Pro	Glu	Ala	Arg	Asn	Ser	Thr	Phe	Leu	Ile	Asp	Gly	Pro	
			900					905					910			
Asp	Thr	Ser	Glu	Cys	Pro	Asn	Glu	Arg	Arg	Ala	Trp	Asn	Ser	Leu	Glu	
		915					920						925			
Val	Glu	Asp	Tyr	Gly	Phe	Gly	Met	Phe	Thr	Thr	Asn	Ile	Trp	Met	Lys	
	930					935					940					
Phe	Arg	Glu	Gly	Ser	Ser	Glu	Val	Cys	Asp	His	Arg	Leu	Met	Ser	Ala	
945					950					955					960	
Ala	Ile	Lys	Asp	Gln	Lys	Ala	Val	His	Ala	Asp	Met	Gly	Tyr	Trp	Ile	
				965					970					975		
Glu	Ser	Ser	Lys	Asn	Gln	Thr	Trp	Gln	Ile	Glu	Lys	Ala	Ser	Leu	Ile	
			980					985					990			
Glu	Val	Lys	Thr	Cys	Leu	Trp	Pro	Lys	Thr	His	Thr	Leu	Trp	Ser	Asn	
		995					1000					1005				
Gly	Val	Leu	Glu	Ser	Gln	Met	Leu	Ile	Pro	Lys	Ser	Tyr	Ala	Gly	Pro	
	1010					1015					1020					
Phe	Ser	Gln	His	Asn	Tyr	Arg	Gln	Gly	Tyr	Ala	Thr	Gln	Thr	Val	Gly	
1025					1030					1035					1040	
Pro	Trp	His	Leu	Gly	Lys	Leu	Glu	Ile	Asp	Phe	Gly	Glu	Cys	Pro	Gly	
				1045					1050					1055		
Thr	Thr	Val	Thr	Ile	Gln	Glu	Asp	Cys	Asp	His	Arg	Gly	Pro	Ser	Leu	
			1060					1065					1070			
Arg	Thr	Thr	Ala	Ser	Gly	Lys	Leu	Val	Thr	Gln	Trp	Cys	Cys	Arg		
		1075				1080						1085				
Ser	Cys	Thr	Met	Pro	Pro	Leu	Arg	Phe	Leu	Gly	Glu	Asp	Gly	Cys	Trp	
	1090					1095					1100					
Tyr	Gly	Met	Glu	Ile	Arg	Pro	Leu	Ser	Glu	Lys	Glu	Glu	Asn	Met	Val	
1105					1110					1115					1120	
Lys	Ser	Gln	Val	Thr	Ala	Gly	Gln	Gly	Thr	Ser	Glu	Thr	Phe	Ser	Met	
				1125					1130					1135		

Gly Leu Leu Cys Leu Thr Leu Phe Val Glu Glu Cys Leu Arg Arg Arg  
 1140 1145 1150  
 Val Thr Arg Lys His Met Ile Leu Val Val Val Ile Thr Leu Cys Ala  
 1155 1160 1165  
 Ile Ile Leu Gly Gly Leu Thr Trp Met Asp Leu Leu Arg Ala Leu Ile  
 1170 1175 1180  
 Met Leu Gly Asp Thr Met Ser Gly Arg Ile Gly Gly Gln Ile His Leu  
 1185 1190 1195 1200  
 Ala Ile Met Ala Val Phe Lys Met Ser Pro Gly Tyr Val Leu Gly Val  
 1205 1210 1215  
 Phe Leu Arg Lys Leu Thr Ser Arg Glu Thr Ala Leu Met Val Ile Gly  
 1220 1225 1230  
 Met Ala Met Thr Thr Val Leu Ser Ile Pro His Asp Leu Met Glu Leu  
 1235 1240 1245  
 Ile Asp Gly Ile Ser Leu Gly Leu Ile Leu Leu Lys Ile Val Thr Gln  
 1250 1255 1260  
 Phe Asp Asn Thr Gln Val Gly Thr Leu Ala Leu Ser Leu Thr Phe Ile  
 1265 1270 1275 1280  
 Arg Ser Thr Met Pro Leu Val Met Ala Trp Arg Thr Ile Met Ala Val  
 1285 1290 1295  
 Leu Phe Val Val Thr Leu Ile Pro Leu Cys Arg Thr Ser Cys Leu Gln  
 1300 1305 1310  
 Lys Gln Ser His Trp Val Glu Ile Thr Ala Leu Ile Leu Gly Ala Gln  
 1315 1320 1325  
 Ala Leu Pro Val Tyr Leu Met Thr Leu Met Lys Gly Ala Ser Arg Arg  
 1330 1335 1340  
 Ser Trp Pro Leu Asn Glu Gly Ile Met Ala Val Gly Leu Val Ser Leu  
 1345 1350 1355 1360  
 Leu Gly Ser Ala Leu Leu Lys Asn Asp Val Pro Leu Ala Gly Pro Met  
 1365 1370 1375  
 Val Ala Gly Gly Leu Leu Leu Ala Ala Tyr Val Met Ser Gly Ser Ser  
 1380 1385 1390  
 Ala Asp Leu Ser Leu Glu Lys Ala Ala Asn Val Gln Trp Asp Glu Met  
 1395 1400 1405  
 Ala Asp Ile Thr Gly Ser Ser Pro Ile Val Glu Val Lys Gln Asp Glu  
 1410 1415 1420  
 Asp Gly Ser Phe Ser Ile Arg Asp Val Glu Glu Thr Asn Met Ile Thr  
 1425 1430 1435 1440  
 Leu Leu Val Lys Leu Ala Leu Ile Thr Val Ser Gly Leu Tyr Pro Leu  
 1445 1450 1455  
 Ala Ile Pro Val Thr Met Thr Leu Trp Tyr Met Trp Gln Val Lys Thr  
 1460 1465 1470  
 Gln Arg Ser Gly Ala Leu Trp Asp Val Pro Ser Pro Ala Ala Thr Lys  
 1475 1480 1485  
 Lys Ala Ala Leu Ser Glu Gly Val Tyr Arg Ile Met Gln Arg Gly Leu  
 1490 1495 1500  
 Phe Gly Lys Thr Gln Val Gly Val Gly Ile His Met Glu Gly Val Phe  
 1505 1510 1515 1520  
 His Thr Met Trp His Val Thr Arg Gly Ser Val Ile Cys His Glu Thr  
 1525 1530 1535  
 Gly Arg Leu Glu Pro Ser Trp Ala Asp Val Arg Asn Asp Met Ile Ser  
 1540 1545 1550  
 Tyr Gly Gly Gly Trp Arg Leu Gly Asp Lys Trp Asp Lys Glu Glu Asp  
 1555 1560 1565  
 Val Gln Val Leu Ala Ile Glu Pro Gly Lys Asn Pro Lys His Val Gln  
 1570 1575 1580  
 Thr Lys Pro Gly Leu Phe Lys Thr Leu Thr Gly Glu Ile Gly Ala Val  
 1585 1590 1595 1600  
 Thr Leu Asp Phe Lys Pro Gly Thr Ser Gly Ser Pro Ile Ile Asn Arg  
 1605 1610 1615  
 Lys Gly Lys Val Ile Gly Leu Tyr Gly Asn Gly Val Val Thr Lys Ser

1620										1625					1630				
Gly	Asp	Tyr	Val	Ser	Ala	Ile	Thr	Gln	Ala	Glu	Arg	Ile	Gly	Glu	Pro				
1635										1640					1645				
Asp	Tyr	Glu	Val	Asp	Glu	Asp	Ile	Phe	Arg	Lys	Lys	Arg	Leu	Thr	Ile				
1650										1655					1660				
Met	Asp	Leu	His	Pro	Gly	Ala	Gly	Lys	Thr	Lys	Arg	Ile	Leu	Pro	Ser				
1665										1670					1675				
Ile	Val	Arg	Glu	Ala	Leu	Lys	Arg	Arg	Leu	Arg	Thr	Leu	Ile	Leu	Ala				
1685										1690					1695				
Pro	Thr	Arg	Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu				
1700										1705					1710				
Pro	Ile	Arg	Tyr	Gln	Thr	Pro	Ala	Val	Lys	Ser	Glu	His	Thr	Gly	Arg				
1715										1720					1725				
Glu	Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Thr	Arg	Leu	Leu				
1730										1735					1740				
Ser	Ser	Thr	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Ile	Val	Met	Asp	Glu	Ala				
1745										1750					1755				
His	Phe	Thr	Asp	Pro	Ser	Ser	Val	Ala	Ala	Arg	Gly	Tyr	Ile	Ser	Thr				
1765										1770					1775				
Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	Ala	Thr	Pro				
1780										1785					1790				
Pro	Gly	Ala	Thr	Asp	Pro	Phe	Pro	Gln	Ser	Asn	Ser	Pro	Ile	Glu	Asp				
1795										1800					1805				
Ile	Glu	Arg	Glu	Ile	Pro	Glu	Arg	Ser	Trp	Asn	Thr	Gly	Phe	Asp	Trp				
1810										1815					1820				
Ile	Thr	Asp	Tyr	Gln	Gly	Lys	Thr	Val	Trp	Phe	Val	Pro	Ser	Ile	Lys				
1825										1830					1835				
Ala	Gly	Asn	Asp	Ile	Ala	Asn	Cys	Leu	Arg	Lys	Ser	Gly	Lys	Lys	Val				
1845										1850					1855				
Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe	Asp	Thr	Glu	Tyr	Pro	Lys	Thr	Lys				
1860										1865					1870				
Leu	Thr	Asp	Trp	Asp	Phe	Val	Val	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly				
1875										1880					1885				
Ala	Asn	Phe	Arg	Ala	Gly	Arg	Val	Ile	Asp	Pro	Arg	Arg	Cys	Leu	Lys				
1890										1895					1900				
Pro	Val	Ile	Leu	Pro	Asp	Gly	Pro	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro				
1905										1910					1915				
Ile	Pro	Val	Thr	Pro	Ala	Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly				
1925										1930					1935				
Arg	Asn	Pro	Ala	Gln	Glu	Asp	Asp	Gln	Tyr	Val	Phe	Ser	Gly	Asp	Pro				
1940										1945					1950				
Leu	Lys	Asn	Asp	Glu	Asp	His	Ala	His	Trp	Thr	Glu	Ala	Lys	Met	Leu				
1955										1960					1965				
Leu	Asp	Asn	Ile	Tyr	Thr	Pro	Glu	Gly	Ile	Ile	Pro	Thr	Leu	Phe	Gly				
1970										1975					1980				
Pro	Glu	Arg	Glu	Lys	Thr	Gln	Ala	Ile	Asp	Gly	Glu	Phe	Arg	Leu	Arg				
1985										1990					1995				
Gly	Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Arg	Arg	Gly	Asp	Leu				
2005										2010					2015				
Pro	Val	Trp	Leu	Ser	Tyr	Lys	Val	Ala	Ser	Ala	Gly	Ile	Ser	Tyr	Glu				
2020										2025					2030				
Asp	Arg	Glu	Trp	Cys	Phe	Thr	Gly	Glu	Arg	Asn	Asn	Gln	Ile	Leu	Glu				
2035										2040					2045				
Glu	Asn	Met	Glu	Val	Glu	Ile	Trp	Thr	Arg	Glu	Gly	Glu	Lys	Lys	Lys				
2050										2055					2060				
Leu	Arg	Pro	Arg																

Ala Lys Leu Ala Leu Asp Asn Ile Val Met Leu His Thr Thr Glu Arg  
 2115 2120 2125  
 Gly Gly Arg Ala Tyr Gln His Ala Leu Asn Glu Leu Pro Glu Ser Leu  
 2130 2135 2140  
 Glu Thr Leu Met Leu Val Ala Leu Leu Gly Ala Met Thr Ala Gly Ile  
 2145 2150 2155 2160  
 Phe Leu Phe Phe Met Gln Gly Lys Gly Ile Gly Lys Leu Ser Met Gly  
 2165 2170 2175  
 Leu Ile Thr Ile Ala Val Ala Ser Gly Leu Leu Trp Val Ala Glu Ile  
 2180 2185 2190  
 Gln Pro Gln Trp Ile Ala Ala Ser Ile Ile Leu Glu Phe Phe Leu Met  
 2195 2200 2205  
 Val Leu Leu Ile Pro Glu Pro Glu Lys Gln Arg Thr Pro Gln Asp Asn  
 2210 2215 2220  
 Gln Leu Ile Tyr Val Ile Leu Thr Ile Leu Thr Ile Ile Gly Leu Ile  
 2225 2230 2235 2240  
 Ala Ala Asn Glu Met Gly Leu Ile Glu Lys Thr Lys Thr Asp Phe Gly  
 2245 2250 2255  
 Phe Tyr Gln Val Lys Thr Glu Thr Thr Ile Leu Asp Val Asp Leu Arg  
 2260 2265 2270  
 Pro Ala Ser Ala Trp Thr Leu Tyr Ala Val Ala Thr Thr Ile Leu Thr  
 2275 2280 2285  
 Pro Met Leu Arg His Thr Ile Glu Asn Thr Ser Ala Asn Leu Ser Leu  
 2290 2295 2300  
 Ala Ala Ile Ala Asn Gln Ala Ala Val Leu Met Gly Leu Gly Lys Gly  
 2305 2310 2315 2320  
 Trp Pro Leu His Arg Met Asp Leu Gly Val Pro Leu Leu Ala Met Gly  
 2325 2330 2335  
 Cys Tyr Ser Gln Val Asn Pro Thr Thr Leu Thr Ala Ser Leu Val Met  
 2340 2345 2350  
 Leu Leu Val His Tyr Ala Ile Ile Gly Pro Gly Leu Gln Ala Lys Ala  
 2355 2360 2365  
 Thr Arg Glu Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro  
 2370 2375 2380  
 Thr Val Asp Gly Ile Thr Val Ile Asp Leu Glu Pro Ile Ser Tyr Asp  
 2385 2390 2395 2400  
 Pro Lys Phe Glu Lys Gln Leu Gly Gln Val Met Leu Leu Val Leu Cys  
 2405 2410 2415  
 Ala Gly Gln Leu Leu Leu Met Arg Thr Thr Trp Ala Phe Cys Glu Val  
 2420 2425 2430  
 Leu Thr Leu Ala Thr Gly Pro Ile Leu Thr Leu Trp Glu Gly Asn Pro  
 2435 2440 2445  
 Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser Thr Ala Asn Ile Phe  
 2450 2455 2460  
 Arg Gly Ser Tyr Leu Ala Gly Ala Gly Leu Ala Phe Ser Leu Ile Lys  
 2465 2470 2475 2480  
 Asn Ala Gln Thr Pro Arg Arg Gly Thr Gly Thr Thr Gly Glu Thr Leu  
 2485 2490 2495  
 Gly Glu Lys Trp Lys Arg Gln Leu Asn Ser Leu Asp Arg Lys Glu Phe  
 2500 2505 2510  
 Glu Glu Tyr Lys Arg Ser Gly Ile Leu Glu Val Asp Arg Thr Glu Ala  
 2515 2520 2525  
 Lys Ser Ala Leu Lys Asp Gly Ser Lys Ile Lys His Ala Val Ser Arg  
 2530 2535 2540  
 Gly Ser Ser Lys Ile Arg Trp Ile Val Glu Arg Gly Met Val Lys Pro  
 2545 2550 2555 2560  
 Lys Gly Lys Val Val Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr  
 2565 2570 2575  
 Tyr Met Ala Thr Leu Lys Asn Val Thr Glu Val Lys Gly Tyr Thr Lys  
 2580 2585 2590  
 Gly Gly Pro Gly His Glu Glu Pro Ile Pro Met Ala Thr Tyr Gly Trp

2595					2600					2605					
Asn	Leu	Val	Lys	Leu	His	Ser	Gly	Val	Asp	Val	Phe	Tyr	Lys	Pro	Thr
2610						2615					2620				
Glu	Gln	Val	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Asn
2625					2630					2635					2640
Pro	Thr	Ile	Glu	Glu	Gly	Arg	Thr	Leu	Arg	Val	Leu	Lys	Met	Val	Glu
				2645					2650					2655	
Pro	Trp	Leu	Ser	Ser	Lys	Pro	Glu	Phe	Cys	Ile	Lys	Val	Leu	Asn	Pro
			2660					2665					2670		
Tyr	Met	Pro	Thr	Val	Ile	Glu	Glu	Leu	Glu	Lys	Leu	Gln	Arg	Lys	His
	2675					2680					2685				
Gly	Gly	Asn	Leu	Val	Arg	Cys	Pro	Leu	Ser	Arg	Asn	Ser	Thr	His	Glu
2690					2695					2700					
Met	Tyr	Trp	Val	Ser	Gly	Ala	Ser	Gly	Asn	Ile	Val	Ser	Ser	Val	Asn
2705					2710					2715					2720
Thr	Thr	Ser	Lys	Met	Leu	Leu	Asn	Arg	Phe	Thr	Thr	Arg	His	Arg	Lys
			2725						2730					2735	
Pro	Thr	Tyr	Glu	Lys	Asp	Val	Asp	Leu	Gly	Ala	Gly	Thr	Arg	Ser	Val
			2740					2745					2750		
Ser	Thr	Glu	Thr	Glu	Lys	Pro	Asp	Met	Thr	Ile	Ile	Gly	Arg	Arg	Leu
	2755					2760						2765			
Gln	Arg	Leu	Gln	Glu	Glu	His	Lys	Glu	Thr	Trp	His	Tyr	Asp	Gln	Glu
2770					2775					2780					
Asn	Pro	Tyr	Arg	Thr	Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Ala	Pro	Ser
2785					2790					2795					2800
Thr	Gly	Ser	Ala	Ser	Ser	Met	Val	Asn	Gly	Val	Val	Lys	Leu	Leu	Thr
			2805						2810					2815	
Lys	Pro	Trp	Asp	Val	Ile	Pro	Met	Val	Thr	Gln	Leu	Ala	Met	Thr	Asp
			2820					2825					2830		
Thr	Thr	Pro	Phe	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr
	2835					2840					2845				
Arg	Thr	Pro	Gln	Pro	Lys	Pro	Gly	Thr	Arg	Met	Val	Met	Thr	Thr	Thr
2850					2855					2860					
Ala	Asn	Trp	Leu	Trp	Ala	Leu	Leu	Gly	Lys	Lys	Lys	Asn	Pro	Arg	Leu
2865					2870					2875					2880
Cys	Thr	Arg	Glu	Glu	Phe	Ile	Ser	Lys	Val	Arg	Ser	Asn	Ala	Ala	Ile
			2885						2890					2895	
Gly	Ala	Val	Phe	Gln	Glu	Glu	Gln	Gly	Trp	Thr	Ser	Ala	Ser	Glu	Ala
			2900					2905					2910		
Val	Asn	Asp	Ser	Arg	Phe	Trp	Glu	Leu	Val	Asp	Lys	Glu	Arg	Ala	Leu
	2915					2920					2925				
His	Gln	Glu	Gly	Lys	Cys	Glu	Ser	Cys	Val	Tyr	Asn	Met	Met	Gly	Lys
2930					2935					2940					
Arg	Glu	Lys	Lys	Leu	Gly	Glu	Phe	Gly	Arg	Ala	Lys	Gly	Ser	Arg	Ala
2945					2950					2955					2960
Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg	Phe	Leu	Glu	Phe	Glu	Ala	Leu
			2965						2970					2975	
Gly	Phe	Leu	Asn	Glu	Asp	His	Trp	Phe	Gly	Arg	Glu	Asn	Ser	Trp	Ser
			2980					2985					2990		
Gly	Val	Glu	Gly	Glu	Gly	Leu	His	Arg	Leu	Gly	Tyr	Ile	Leu	Glu	Glu
	2995					3000					3005				
Ile	Asp	Lys	Lys	Asp	Gly	Asp	Leu	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly
3010					3015					3020					
Trp	Asp	Thr	Arg	Ile	Thr	Glu	Asp	Asp	Leu	Gln	Asn	Glu	Glu	Leu	Ile
3025					3030					3035					3040
Thr	Glu	Gln	Met	Ala	Pro	His	His	Lys	Ile	Leu	Ala	Lys	Ala	Ile	Phe
			3045						3050					3055	
Lys	Leu	Thr	Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Thr	Pro
	3060							3065					3070		
Arg	Gly	Ala	Val	Met	Asp	Ile	Ile	Ser	Arg	Lys	Asp	Gln	Arg	Gly	Ser
	3075					3080						3085			

Gly	Gln	Val	Gly	Thr	Tyr	Gly	Leu	Asn	Thr	Phe	Thr	Asn	Met	Glu	Val		
		3090					3095					3100					
Gln	Leu	Ile	Arg	Gln	Met	Glu	Ala	Glu	Gly	Val	Ile	Thr	Gln	Asp	Asp		
3105					3110					3115					3120		
Met	Gln	Asn	Pro	Lys	Gly	Leu	Lys	Glu	Arg	Val	Glu	Lys	Trp	Leu	Lys		
				3125					3130					3135			
Glu	Cys	Gly	Val	Asp	Arg	Leu	Lys	Arg	Met	Ala	Ile	Ser	Gly	Asp	Asp		
			3140					3145					3150				
Cys	Val	Val	Lys	Pro	Leu	Asp	Glu	Arg	Phe	Gly	Thr	Ser	Leu	Leu	Phe		
		3155					3160					3165					
Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Ile	Pro	Gln	Trp	Glu	Pro		
	3170				3175						3180						
Ser	Lys	Gly	Trp	Lys	Asn	Trp	Gln	Glu	Val	Pro	Phe	Cys	Ser	His	His		
3185					3190					3195					3200		
Phe	His	Lys	Ile	Phe	Met	Lys	Asp	Gly	Arg	Ser	Leu	Val	Val	Pro	Cys		
				3205					3210					3215			
Arg	Asn	Gln	Asp	Glu	Leu	Ile	Gly	Arg	Ala	Arg	Ile	Ser	Gln	Gly	Ala		
			3220					3225					3230				
Gly	Trp	Ser	Leu	Arg	Glu	Thr	Ala	Cys	Leu	Gly	Lys	Ala	Tyr	Ala	Gln		
		3235					3240					3245					
Met	Trp	Ser	Leu	Met	Tyr	Phe	His	Arg	Arg	Asp	Leu	Arg	Leu	Ala	Ser		
	3250					3255				3260							
Met	Ala	Ile	Cys	Ser	Ala	Val	Pro	Thr	Glu	Trp	Phe	Pro	Thr	Ser	Arg		
3265					3270					3275					3280		
Thr	Thr	Trp	Ser	Ile	His	Ala	His	His	Gln	Trp	Met	Thr	Thr	Glu	Asp		
				3285					3290					3295			
Met	Leu	Lys	Val	Trp	Asn	Arg	Val	Trp	Ile	Glu	Asp	Asn	Pro	Asn	Met		
		3300						3305					3310				
Thr	Asp	Lys	Thr	Pro	Val	His	Ser	Trp	Glu	Asp	Ile	Pro	Tyr	Leu	Gly		
	3315						3320					3325					
Lys	Arg	Glu	Asp	Leu	Trp	Cys	Gly	Ser	Leu	Ile	Gly	Leu	Ser	Ser	Arg		
	3330					3335					3340						
Ala	Thr	Trp	Ala	Lys	Asn	Ile	His	Thr	Ala	Ile	Thr	Gln	Val	Arg	Asn		
3345					3350					3355					3360		
Leu	Ile	Gly	Lys	Glu	Glu	Tyr	Val	Asp	Tyr	Met	Pro	Val	Met	Lys	Arg		
			3365					3370						3375			
Tyr	Ser	Ala	Pro	Ser	Glu	Ser	Glu	Gly	Val	Leu							
			3380					3385									

<210> 16

<211> 10649

<212> DNA

<213> Recombinant Dengue 4 virus strain rDEN4

<400> 16

agttgtagt	ctgtgtggac	cgacaaggac	agttccaaat	cggaagcttg	cttaacacag	60
ttctaacagt	ttgtttgaat	agagagcaga	tctctggaaa	aatgaaccaa	cgaaaaaagg	120
tggttagacc	acctttcaat	atgctgaaac	gcgagagaaa	ccgcgtatca	acccctcaag	180
ggttggtgaa	gagattctca	accggacttt	tttctgggaa	aggaccctta	cggatggtgc	240
tagcattcat	cacgtttttg	cgagtccttt	ccatcccacc	aacagcaggg	attctgaaga	300
gatggggaca	gttgaagaaa	aataaggcca	tcaagatact	gattggattc	aggaaggaga	360
taggccgcat	gctgaacatc	ttgaacggga	gaaaaaggtc	aacgataaca	ttgctgtgct	420
tgattcccac	cgtaatggcg	ttttccctca	gcacaagaga	tggcgaaccc	ctcatgatag	480
tggcaaaaaca	tgaaaggggg	agacctctct	tgtttaagac	aacagagggg	atcaacaaat	540
gcactctcat	tgccatggac	ttgggtgaaa	tgtgtgagga	cactgtcacg	tataaatgcc	600
ccctactggt	caataaccgaa	cctgaagaca	ttgattgctg	gtgcaacctc	acgtctacct	660
gggtcatgta	tgggacatgc	acccagagcg	gagaacggag	acgagagaag	cgctcagtag	720
ctttaacacc	acattcagga	atgggattgg	aaacaagagc	tgagacatgg	atgtcatcgg	780
aaggggcttg	gaagcatgct	cagagagtag	agagctggat	actcagaaac	ccaggattcg	840
cgctcttggc	aggatttatg	gcttatatga	ttgggcaaac	aggaatccag	cgaactgtct	900

tctttgtcct	aatgatgctg	gtcgcccat	cctacggaat	gcgatgcgta	ggagtaggaa	960
acagagactt	tgtggaagga	gtctcaggtg	gagcatgggt	cgacctgggtg	ctagaacatg	1020
gaggatgcgt	cacaaccatg	gcccagggaa	aaccaacctt	ggattttgaa	ctgactaaga	1080
caacagccaa	ggaagtggct	ctgttaagaa	cctattgcat	tgaagcctca	atatcaaaca	1140
taactacggc	aacaagatgt	ccaacgcaag	gagagcctta	tctgaaagag	gaacaggacc	1200
aacagtacat	ttgccggaga	gatgtggtag	acagagggtg	gggcaatggc	tgtggcttgt	1260
ttgaaaagg	aggagtgtgtg	acatgtgcga	agttttcatg	ttcggggaag	ataacaggca	1320
atlttggtcca	aattgagaac	cttgaatata	cagtgggtgt	aacagtccac	aatggagaca	1380
cccatgcagt	aggaaatgac	acatccaatc	atggagttac	agccatgata	actcccaggt	1440
caccatcggt	ggaagtcaaa	ttgccggact	atggagaact	aacactcgat	tgtgaacca	1500
ggtctggaat	tgactttaat	gagatgattc	tgatgaaaat	gaaaaagaaa	acatggctcg	1560
tgcataagca	atggtttttg	gatctgcctc	ttccatggac	agcaggagca	gacacatcag	1620
aggttcactg	gaattacaaa	gagagaatgg	tgacatttaa	ggttcctcat	gccaagagac	1680
aggatgtgac	agtgtggga	tctcaggaag	gagccatgca	ttctgccctc	gctggagcca	1740
cagaagtgga	ctccggtgat	ggaaatcaca	tgtttgagg	acatcttaag	tgcaaagtcc	1800
gtatggagaa	attgagaatc	aagggaatgt	catacacgat	gtgttcagga	aagttttcaa	1860
ttgacaaaga	gatggcagaa	acacagcatg	ggacaacagt	ggtgaaagtc	aagtatgaag	1920
gtgctggagc	tccgtgtaaa	gtccccatag	agataagaga	tgtaaacaag	gaaaaagtg	1980
ttgggcgtat	catctcatcc	accccttttg	ctgagaatac	caacagtgtg	accaacatag	2040
aattagaacc	cccctttggg	gacagctaca	tagtgatagg	tggttgaaac	agcgcattaa	2100
cactccattg	gttcaggaaa	gggagttcca	ttggcaagat	gtttgagtc	acatacagag	2160
gtgcaaaacg	aatggccatt	ctaggtgaaa	cagcttgga	ttttggttcc	gttggtggac	2220
tgttcacatc	attgggaaag	gctgtgcacc	aggttttttg	aagtgtgtat	acaaccatgt	2280
ttggaggagt	ctcatggatg	attagaatcc	taattgggtt	cttagtggtg	tggattggca	2340
cgaactcgag	gaacacttca	atggctatga	cgtgcatagc	tggtggagga	atcactctgt	2400
ttctgggctt	cacagttcaa	gcagacatgg	gttgtgtggc	gtcatggagt	gggaaagaat	2460
tgaagtgtgg	aagcggaatt	tttgtggttg	acaacgtgca	cacttgagca	gaacagtaca	2520
aatttcaacc	agagtcccca	gcgagactag	cgtctgcaat	attaaatgcc	cacaaagatg	2580
gggtctgtgg	aattagatca	accacgaggc	tggaaaatgt	catgtggaag	caaataacca	2640
acgagctaaa	ctatgttctc	tgggaaggag	gacatgcact	cactgtagt	gctggggatg	2700
tgaaggggt	gttgaccaaa	ggcaagagag	cactcacacc	cccagttagt	gatctgaaat	2760
attcatggaa	gacatgggga	aaagcaaaaa	tcttcacccc	agaagcaaga	aatagcacat	2820
ttttaataga	cggaccagac	acctctgaat	gccccaatga	acgaagagca	tggaaactctc	2880
ttgaggtgga	agactatgga	tttggcatgt	tcacgaccaa	catatggatg	aaattccgag	2940
aagggaagttc	agaagtgtgt	gaccacaggt	taatgtcagc	tgcaattaaa	gatcagaaaag	3000
ctgtgcatgc	tgacatgggt	tattggatag	agagctcaaa	aaaccagacc	tggcagatag	3060
agaaagcatc	tcttattgaa	gtgaaaacat	gtctgtggcc	caagaccac	acactgtgga	3120
gcaatggagt	gctggaaagc	cagatgctca	ttccaaaatc	atatgcgggc	cctttttcac	3180
agcacaatta	ccgccagggc	tatgccacgc	aaaccgtggg	cccatggcac	ttaggcaaat	3240
tagagataga	ctttggagaa	tgccccggaa	caacagtcac	aattcaggag	gattgtgacc	3300
atagaggccc	atctttgagg	accaccactg	catctggaaa	actagtacag	caatggtgct	3360
gccgctcctg	cacgatgcct	cccttaaggt	tcttgggaga	agatgggtgc	tggatggga	3420
tggagattag	gcccttgagt	gaaaaagaag	agaacatggt	caaatcacag	gtgacggccg	3480
gacagggcac	atcagaaact	ttttctatgg	gtctgttgtg	cctgaccttg	tttgtggaag	3540
aatgcttgag	gagaagagtc	actaggaaac	acatgatatt	agttgtggtg	atcactcttt	3600
gtgctatcat	cctgggaggc	ctcacatgga	tggacttact	acgagccctc	atcatgtttg	3660
gggacactat	gtctggtaga	ataggaggac	agatccacct	agccatcatg	gcagtgttca	3720
agatgtcacc	aggatacgtg	ctgggtgtgt	ttttaaggaa	actcacttca	agagagacag	3780
cactaatggt	aataggaatg	gccatgacaa	cgggtgctttc	aattccacat	gaccttatgg	3840
aactcattga	tggaatatca	ctgggactaa	ttttgctaaa	aatagtaaca	cagtttgaca	3900
acacccaagt	gggaacctta	gctctttcct	tgactttcat	aagatcaaca	atgccattgg	3960
tcatggcttg	gaggaccatt	atggctgtgt	tgtttgtggt	cacactcatt	cctttgtgca	4020
ggacaagctg	tcttcaaaaa	cagtctcatt	gggtagaaat	aacagcactc	atcctaggag	4080
cccaagctct	gccagtgtac	ctaatgactc	ttatgaaagg	agcctcaaga	agatcttggc	4140
ctcttaacga	gggcataatg	gctgtgggtt	tggttagtct	cttaggaagc	gctcttttaa	4200
agaatgagtg	cccttttagct	ggcccaatgg	tggcaggagg	cttacttctg	gcggcttacg	4260
tgatgagtg	tagctcagca	gatctgtcac	tagagaaggc	cgccaacgtg	cagtgggatg	4320
aaatggcaga	cataacaggc	tcaagcccaa	tcgtagaagt	gaagcaggat	gaagatggct	4380
ctttctccat	acgggacgtc	gaggaaacca	atatgataac	ccttttggtg	aaactggcac	4440
tgataacagt	gtcaggtctc	tacccttggt	caattccagt	cacaatgacc	ttatggtaca	4500
tgtggcaagt	gaaaacacaa	agatcaggag	ccctgtggga	cgtcccctca	cccgtgcca	4560

ctaaaaaagc	cgcactgtct	gaaggagtgt	acaggatcat	gcaaagaggg	ttatttcggga	4620
aaactcaggt	tggagtaggg	atacacatgg	aagggtgtatt	tcacacaatg	tggcatgtaa	4680
caagaggatc	agtgatctgc	cacgagactg	ggagattgga	gccatcttgg	gctgacgtca	4740
ggaatgacat	gatatcatac	ggtgggggat	ggaggcttgg	agacaaatgg	gacaaagaag	4800
aagacgttca	ggtcctcgcc	atagaaccag	gaaaaaatcc	taaacatgtc	caaacgaaac	4860
ctggcctttt	caagacccta	actggagaaa	ttggagcagt	aacattagat	ttcaaaccgg	4920
gaacgtctgg	ttctcccatc	atcaacagga	aaggaaaagt	catcggactc	tatggaaatg	4980
gagtagttac	caaatcaggt	gattacgtca	gtgccataac	gcaagccgaa	agaattggag	5040
agccagatta	tgaagtggat	gaggacatct	ttcgaaagaa	aagattaact	ataatggact	5100
tacaccccg	agctggaaa	acaaaaagaa	ttcttccatc	aatagtgaga	gaagccttaa	5160
aaaggaggct	acgaactttg	attttagctc	ccacgagagt	ggtggcggcc	gagatggaag	5220
aggccctacg	tggactgcca	atccgttatc	agaccccgac	tgtgaaatca	gaacacacag	5280
gaagagagat	tgatagacct	atgtgtcatg	caaccttcac	aacaagactt	ttgtcatcaa	5340
ccagggttcc	aaattacaac	cttatagtga	tggatgaagc	acatttcacc	gatccttcta	5400
gtgtcgcggc	tagaggatac	atctcgacca	gggtggaaat	gggagaggca	gcagccatct	5460
tcatgaccgc	aacccctccc	ggagcgacag	atccctttcc	ccagagcaac	agcccaatag	5520
aagacatcga	gagggaaatt	ccggaaggt	catggaacac	agggttcgac	tggataacag	5580
actaccaagg	gaaaactgtg	tggtttgttc	ccagcataaa	agctggaaat	gacattgcaa	5640
attgttttag	aaagtctggga	aagaaagtta	tccagttgag	taggaaaacc	tttgatacag	5700
agtatccaaa	aacgaaactc	acggactggg	actttgtggt	cactacagac	atatctgaaa	5760
tgggggccaa	ttttagagcc	gggagagtga	tagaccctag	aagatgcctc	aagccagtta	5820
tcctagctga	tgggcagag	agagtcattt	tagcaggctc	tattccagt	actccagcaa	5880
gcgctgctca	gagaagaggg	cgaataggaa	ggaacccagc	acaagaagac	gaccaatacg	5940
ttttctccgg	agacccacta	aaaaatgatg	aagatcatgc	ccactggaca	gaagcaaaga	6000
tgtgtcttga	caatatctac	accccagaag	ggatcattcc	aacattgttt	ggtccggaaa	6060
gggaaaaaac	ccaagccatt	gatggagagt	ttcgccctcag	agggaacaa	aggaagactt	6120
ttgtggaatt	aatgaggaga	ggagaccttc	cgggtgtggct	gagctataag	gtagcttctg	6180
ctggcatttc	ttacgaagat	cgggaatggt	gcttcacagg	ggaaagaaat	aaccaaaattt	6240
tagaagaaaa	catggaggtt	gaaatttgga	ctagagaggg	agaaaagaaa	aagctaaggc	6300
caagatgggt	atagtcacgt	gtatacgctg	acccctaggc	tttgaaggat	ttcaaggagt	6360
ttgccagtgg	aaggaagagt	ataactctcg	acatcctaac	agagattgcc	agtttgccaa	6420
cttacctttc	ctctagggcc	aagctcgccc	ttgataacat	agtcatgctc	cacacaacag	6480
aaagaggagg	gagggcctat	caacacgccc	tgaacgaact	tccggagtca	ctggaaacac	6540
tcatgcttgt	agctttacta	ggtgctatga	cagcaggcat	cttcctgttt	ttcatgcaag	6600
ggaaaggaat	agggaaattg	tcaatgggtt	tgataaccat	tgcggtggct	agtggcttgc	6660
tctgggtagc	agaaattcaa	ccccagtggg	tagcggcctc	aatcatacta	gagttttttc	6720
tcatggtact	gttgataccg	gaaccagaaa	aacaaaggac	cccacaagac	aatcaattga	6780
tctacgtcat	attgaccatt	ctcaccatca	ttggtcta	agcagccaac	gagatggggc	6840
tgattgaaaa	aacaaaaacg	gattttgggt	tttaccaggt	aaaaacagaa	accaccatcc	6900
tcgatgtgga	cttgagacca	gcttcagcat	ggacgctcta	tgcatgagcc	accacaattc	6960
tgactcccat	gctgagacac	accatagaaa	acacgtcggc	caacctatct	ctagcagcca	7020
ttgccaaacca	ggcagccgtc	ctaattgggg	ttggaaaagg	atggccgctc	cacagaatgg	7080
acctcgggtg	gccgctgtta	gcaatgggat	gctattctca	agtgaaccca	acaaccttga	7140
cagcatcctt	agtcatgctt	ttagtccatt	atgcaataat	aggcccagga	ttgcaggcaa	7200
aagccacaag	agaggcccag	aaaaggacag	ctgctgggat	catgaaaaat	cccacagtgg	7260
acgggataac	agtaatagat	ctagaaccaa	tatcctatga	cccaaaattt	gaaaagcaat	7320
tagggcaggt	catgctacta	gtcttggtg	ctggacaact	actcttgatg	agaacaacat	7380
gggctttctg	tgaagtcttg	actttggcca	caggaccaat	cttgaccttg	tgggagggca	7440
acccgggaag	gttttggaac	acgaccatag	ccgtatccac	cgccaacatt	ttcaggggaa	7500
gttacttggc	gggagctgga	ctggcttttt	cactcataaa	gaatgcacaa	acccctagga	7560
ggggaactgg	gaccacagga	gagacactgg	gagagaagtg	gaagagacag	ctaaactcat	7620
tagacagaaa	agagtttgaa	gagtataaaa	gaagtggaat	actagaagtg	gacaggactg	7680
aagccaagtc	tgccctgaaa	gatgggtcta	aaatcaagca	tgcatgatca	agagggtcca	7740
gtaagatcag	atggattggt	gagagaggga	tggtaaagcc	aaaagggaaa	gttgtagatc	7800
ttggctgtgg	gagaggagga	tggtcttatt	acatggcgac	actcaagaac	gtgactgaag	7860
tgaagggtta	tacaaaagga	ggtccaggga	atgaagaacc	gattcccatg	gtactttatg	7920
gttggaattt	ggtcaaactc	cattcagggg	ttgacgtgtt	ctacaaaccc	acagagcaag	7980
tggacaccct	gctctgtgat	attggggagt	catcttctaa	tccaacaata	gaggaaggaa	8040
gaacatttaag	agttttgaag	atgggtggagc	catggctctc	ttcaaaacct	gaattctgca	8100
tcaaagtcct	taacccttac	atgccaacag	tcatagaaga	gctggagaaa	ctgcagagaa	8160
aacatggtgg	gaaccttgtc	agatgcccgc	tgtccaggaa	ctccacccat	gagatgtatt	8220



```

gggtgtcagg agcgtcggga aacattgtga gctctgtgaa cacaacatca aagatgttgt 8280
tgaacaggtt cacaacaagg cataggaaac ccacttatga gaaggacgta gatcttgggg 8340
caggaacgag aagtgtctcc actgaaacag aaaaaccaga catgacaatc attgggagaa 8400
ggcttcagcg attgcaagaa gagcacaagg aaacctggca ttatgatcag gaaaacccat 8460
acagaacctg ggcgtatcat ggaagctatg aagctccttc gacaggctct gcatcctcca 8520
tgggtgaacgg ggtggtaaaa ctgctaacaa aacctcggga tgtgattcca atggtgactc 8580
agttagccat gacagataca accccttttg ggcaacaaag agtgttcaaa gagaaggtgg 8640
ataccagaac accacaacca aaacccggta cacgaatggt tatgaccacg acagccaatt 8700
ggctgtgggc cctccttgga aagaagaaaa atcccagact gtgcacaagg gaagagttca 8760
tctcaaaagt tagatcaaac gcagccatag gcgcagctct tcaggaagaa cagggatgga 8820
catcagccag tgaagctgtg aatgacagcc ggttttggga actggttgac aaagaaaggg 8880
ccctacacca ggaagggaaa tgtgaatcgt gtgtctataa catgatggga aaacgtgaga 8940
aaaagttagg agagtttggc agagccaagg gaagccgagc aatctggtac atgtggctgg 9000
gagcgcgggt tctggaattt gaagccctgg gttttttgaa tgaagatcac tggtttggca 9060
gagaaaattc atggagtggg gtggaagggg aaggtctgca cagattggga tatatcctgg 9120
aggagataga caagaaggat ggagacctaa tgtatgctga tgacacagca ggctgggaca 9180
caagaatcac tgaggatgac cttcaaaatg aggaactgat cacggaacag atggctcccc 9240
accacaagat cctagccaaa gccattttca aactaaccta tcaaaacaaa gtggtgaaag 9300
tcctcagacc cacaccgchg ggagcgggtg tggatatcat atccaggaaa gaccaaagag 9360
gtagtggaca agttggaaca tatggtttga acacattcac caacatggaa gttcaactca 9420
tccgccaaat ggaagctgaa ggagtcacat cacaagatga catgcagaac ccaaaagggt 9480
tgaaagaaaag agttgagaaa tggctgaaag agtgtggtgt cgacaggtta aagaggatgg 9540
caatcagttg agacgattgc gtggtgaagc ccctagatga gaggtttggc acttccctcc 9600
tcttcttgaa cgacatggga aaggtgagga aagacattcc gcagtgggaa ccatctaagg 9660
gatggaaaaa ctggcaagag gttccttttt gctcccacca ctttcacaag atctttatga 9720
aggatggccg ctactagtt gttccatgta gaaaccagga tgaactgata gggagagcca 9780
gaatctcgca gggagctgga tggagcttaa gagaaacagc ctgcctgggc aaagcttacg 9840
cccagatgtg gtcgcttatg tacttccaca gaagggatct gcgtttagcc tccatggcca 9900
tatgctcagc agttccaacg gaatggtttc caacaagcag aacaacatgg tcaatccacg 9960
ctcatcacca gtgatgacc actgaagata tgctcaaagt gtggaacaga gtgtgatatg 10020
aagacaaccc taatatgact gacaagactc cagtcatttc gtgggaagat ataccttacc 10080
tagggaaaaag agaggatttg tgggtggtat ccctgattgg actttcttcc agagccacct 10140
gggcgaagaa cattcatacg gccataaccc aggtcaggaa cctgatcgga aaagaggat 10200
acgtggatta catgccagta atgaaaagat acagtgtccc ttcagagagt gaaggagttc 10260
tgtaattacc aacaacaaac accaaaggct attgaagtca ggccacttgt gccacggttt 10320
gagcaaaccg tgctgcctgt agctccgcca ataatgggag gcgtaataat ccccaggagg 10380
gccatgcgcc acggaagctg tacgcgtggc atattggact agcggttaga ggagaccctt 10440
cccatcactg ataaaacgca gcaaaagggg gccgaagcc aggaggaagc tgtactcctg 10500
gtggaaggac tagaggttag aggagacccc cccaacacaa aaacagcata ttgacgctgg 10560
gaaagaccag agatcctgct gtctctgcaa catcaatcca ggcacagagc gccgcaagat 10620
ggattggtgt tgttgatcca acaggttct

```

<210> 17

<211> 3388

<212> PRT

<213> Recombinant Dengue rDEN2/4d30

<400> 17

```

Met Asn Asn Gln Arg Lys Lys Ala Arg Asn Thr Pro Phe Asn Met Leu
 1          5          10          15
Lys Arg Glu Arg Asn Arg Val Ser Thr Val Gln Gln Leu Thr Lys Arg
 20          25          30
Phe Ser Leu Gly Met Leu Gln Gly Arg Gly Pro Leu Lys Leu Phe Met
 35          40          45
Ala Leu Val Ala Phe Leu Arg Phe Leu Thr Ile Pro Pro Thr Ala Gly
 50          55          60
Ile Leu Lys Arg Trp Gly Thr Ile Lys Lys Ser Lys Ala Ile Asn Val
 65          70          75          80
Leu Arg Gly Phe Arg Lys Glu Ile Gly Arg Met Leu Asn Ile Leu Asn
 85          90          95
Arg Arg Arg Arg Thr Ala Gly Met Ile Ile Met Leu Ile Pro Thr Val

```

			100					105					110		
Met	Ala	Phe	His	Leu	Thr	Thr	Arg	Asn	Gly	Glu	Pro	His	Met	Ile	Val
		115					120					125			
Ser	Arg	Gln	Glu	Lys	Gly	Lys	Ser	Leu	Leu	Phe	Lys	Thr	Glu	Asp	Gly
		130				135					140				
Val	Asn	Met	Cys	Thr	Leu	Met	Ala	Met	Asp	Leu	Gly	Glu	Leu	Cys	Glu
145					150				155						160
Asp	Thr	Ile	Thr	Tyr	Lys	Cys	Pro	Leu	Leu	Arg	Gln	Asn	Glu	Pro	Glu
				165					170					175	
Asp	Ile	Asp	Cys	Trp	Cys	Asn	Ser	Thr	Ser	Thr	Trp	Val	Thr	Tyr	Gly
			180					185					190		
Thr	Cys	Thr	Thr	Thr	Gly	Glu	His	Arg	Arg	Glu	Lys	Arg	Ser	Val	Ala
			195				200					205			
Leu	Val	Pro	His	Val	Gly	Met	Gly	Leu	Glu	Thr	Arg	Thr	Glu	Thr	Trp
						215					220				
Met	Ser	Ser	Glu	Gly	Ala	Trp	Lys	His	Ala	Gln	Arg	Ile	Glu	Thr	Trp
225					230					235					240
Ile	Leu	Arg	His	Pro	Gly	Phe	Thr	Ile	Met	Ala	Ala	Ile	Leu	Ala	Tyr
				245					250					255	
Thr	Ile	Gly	Thr	Thr	His	Phe	Gln	Arg	Ala	Leu	Ile	Phe	Ile	Leu	Leu
			260					265					270		
Thr	Ala	Val	Ala	Pro	Ser	Met	Thr	Met	Arg	Cys	Ile	Gly	Ile	Ser	Asn
			275				280					285			
Arg	Asp	Phe	Val	Glu	Gly	Val	Ser	Gly	Gly	Ser	Trp	Val	Asp	Ile	Val
						295					300				
Leu	Glu	His	Gly	Ser	Cys	Val	Thr	Thr	Met	Ala	Lys	Asn	Lys	Pro	Thr
305					310					315					320
Leu	Asp	Phe	Glu	Leu	Ile	Lys	Thr	Glu	Ala	Lys	Gln	Pro	Ala	Thr	Leu
				325					330					335	
Arg	Lys	Tyr	Cys	Ile	Glu	Ala	Lys	Leu	Thr	Asn	Thr	Thr	Thr	Glu	Ser
			340					345					350		
Arg	Cys	Pro	Thr	Gln	Gly	Glu	Pro	Ser	Leu	Asn	Glu	Glu	Gln	Asp	Lys
			355				360					365			
Arg	Phe	Val	Cys	Lys	His	Ser	Met	Val	Asp	Arg	Gly	Trp	Gly	Asn	Gly
						375					380				
Cys	Gly	Leu	Phe	Gly	Lys	Gly	Gly	Ile	Val	Thr	Cys	Ala	Met	Phe	Thr
385					390					395					400
Cys	Lys	Lys	Asn	Met	Glu	Gly	Lys	Val	Val	Gln	Pro	Glu	Asn	Leu	Glu
				405					410					415	
Tyr	Thr	Ile	Val	Ile	Thr	Pro	His	Ser	Gly	Glu	Glu	His	Ala	Val	Gly
			420					425					430		
Asn	Asp	Thr	Gly	Lys	His	Gly	Lys	Glu	Ile	Lys	Ile	Thr	Pro	Gln	Ser
			435				440					445			
Ser	Ile	Thr	Glu	Ala	Glu	Leu	Thr	Gly	Tyr	Gly	Thr	Val	Thr	Met	Glu
						455					460				



		1075					1080					1085				
Arg	Ser	Cys	Thr	Met	Pro	Pro	Leu	Arg	Phe	Leu	Gly	Glu	Asp	Gly	Cys	
	1090					1095					1100					
Trp	Tyr	Gly	Met	Glu	Ile	Arg	Pro	Leu	Ser	Glu	Lys	Glu	Glu	Asn	Met	
1105					1110					1115					1120	
Val	Lys	Ser	Gln	Val	Thr	Ala	Gly	Gln	Gly	Thr	Ser	Glu	Thr	Phe	Ser	
				1125					1130					1135		
Met	Gly	Leu	Leu	Cys	Leu	Thr	Leu	Phe	Val	Glu	Glu	Cys	Leu	Arg	Arg	
			1140					1145					1150			
Arg	Val	Thr	Arg	Lys	His	Met	Ile	Leu	Val	Val	Val	Ile	Thr	Leu	Cys	
		1155					1160					1165				
Ala	Ile	Ile	Leu	Gly	Gly	Leu	Thr	Trp	Met	Asp	Leu	Leu	Arg	Ala	Leu	
	1170					1175					1180					
Ile	Met	Leu	Gly	Asp	Thr	Met	Ser	Gly	Arg	Ile	Gly	Gly	Gln	Ile	His	
1185					1190					1195					1200	
Leu	Ala	Ile	Met	Ala	Val	Phe	Lys	Met	Ser	Pro	Gly	Tyr	Val	Leu	Gly	
			1205						1210					1215		
Val	Phe	Leu	Arg	Lys	Leu	Thr	Ser	Arg	Glu	Thr	Ala	Leu	Met	Val	Ile	
			1220					1225					1230			
Gly	Met	Ala	Met	Thr	Thr	Val	Leu	Ser	Ile	Pro	His	Asp	Leu	Met	Glu	
		1235					1240					1245				
Leu	Ile	Asp	Gly	Ile	Ser	Leu	Gly	Leu	Ile	Leu	Leu	Lys	Ile	Val	Thr	
	1250					1255				1260						
Gln	Phe	Asp	Asn	Thr	Gln	Val	Gly	Thr	Leu	Ala	Leu	Ser	Leu	Thr	Phe	
1265					1270					1275					1280	
Ile	Arg	Ser	Thr	Met	Pro	Leu	Val	Met	Ala	Trp	Arg	Thr	Ile	Met	Ala	
			1285						1290					1295		
Val	Leu	Phe	Val	Val	Thr	Leu	Ile	Pro	Leu	Cys	Arg	Thr	Ser	Cys	Leu	
			1300					1305					1310			
Gln	Lys	Gln	Ser	His	Trp	Val	Glu	Ile	Thr	Ala	Leu	Ile	Leu	Gly	Ala	
		1315					1320					1325				
Gln	Ala	Leu	Pro	Val	Tyr	Leu	Met	Thr	Leu	Met	Lys	Gly	Ala	Ser	Arg	
	1330					1335					1340					
Arg	Ser	Trp	Pro	Leu	Asn	Glu	Gly	Ile	Met	Ala	Val	Gly	Leu	Val	Ser	
1345					1350					1355					1360	
Leu	Leu	Gly	Ser	Ala	Leu	Leu	Lys	Asn	Asp	Val	Pro	Leu	Ala	Gly	Pro	
			1365						1370					1375		
Met	Val	Ala	Gly	Gly	Leu	Leu	Leu	Ala	Ala	Tyr	Val	Met	Ser	Gly	Ser	
		1380						1385					1390			
Ser	Ala	Asp	Leu	Ser	Leu	Glu	Lys	Ala	Ala	Asn	Val	Gln	Trp	Asp	Glu	
		1395					1400					1405				
Met	Ala	Asp	Ile	Thr	Gly	Ser	Ser	Pro	Ile	Val	Glu	Val	Lys	Gln	Asp	
	1410				1415						1420					
Glu	Asp	Gly	Ser	Phe	Ser	Ile	Arg	Asp	Val	Glu	Glu	Thr				

Asp	Val	Gln	Val	Leu	Ala	Ile	Glu	Pro	Gly	Lys	Asn	Pro	Lys	His	Val	1570	1575	1580
Gln	Thr	Lys	Pro	Gly	Leu	Phe	Lys	Thr	Leu	Thr	Gly	Glu	Ile	Gly	Ala	1585	1590	1595
Val	Thr	Leu	Asp	Phe	Lys	Pro	Gly	Thr	Ser	Gly	Ser	Pro	Ile	Ile	Asn	1605	1610	1615
Arg	Lys	Gly	Lys	Val	Ile	Gly	Leu	Tyr	Gly	Asn	Gly	Val	Val	Thr	Lys	1620	1625	1630
Ser	Gly	Asp	Tyr	Val	Ser	Ala	Ile	Thr	Gln	Ala	Glu	Arg	Ile	Gly	Glu	1635	1640	1645
Pro	Asp	Tyr	Glu	Val	Asp	Glu	Asp	Ile	Phe	Arg	Lys	Lys	Arg	Leu	Thr	1650	1655	1660
Ile	Met	Asp	Leu	His	Pro	Gly	Ala	Gly	Lys	Thr	Lys	Arg	Ile	Leu	Pro	1665	1670	1675
Ser	Ile	Val	Arg	Glu	Ala	Leu	Lys	Arg	Arg	Leu	Arg	Thr	Leu	Ile	Leu	1685	1690	1695
Ala	Pro	Thr	Arg	Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	1700	1705	1710
Leu	Pro	Ile	Arg	Tyr	Gln	Thr	Pro	Ala	Val	Lys	Ser	Glu	His	Thr	Gly	1715	1720	1725
Arg	Glu	Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Thr	Arg	Leu	1730	1735	1740
Leu	Ser	Ser	Thr	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Ile	Val	Met	Asp	Glu	1745	1750	1755
Ala	His	Phe	Thr	Asp	Pro	Ser	Ser	Val	Ala	Ala	Arg	Gly	Tyr	Ile	Ser	1765	1770	1775
Thr	Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	Ala	Thr	1780	1785	1790
Pro	Pro	Gly	Ala	Thr	Asp	Pro	Phe	Pro	Gln	Ser	Asn	Ser	Pro	Ile	Glu	1795	1800	1805
Asp	Ile	Glu	Arg	Glu	Ile	Pro	Glu	Arg	Ser	Trp	Asn	Thr	Gly	Phe	Asp	1810	1815	1820
Trp	Ile	Thr	Asp	Tyr	Gln	Gly	Lys	Thr	Val	Trp	Phe	Val	Pro	Ser	Ile	1825	1830	1835
Lys	Ala	Gly	Asn	Asp	Ile	Ala	Asn	Cys	Leu	Arg	Lys	Ser	Gly	Lys	Lys	1845	1850	1855
Val	Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe	Asp	Thr	Glu	Tyr	Pro	Lys	Thr	1860	1865	1870
Lys	Leu	Thr	Asp	Trp	Asp	Phe	Val	Val	Thr	Thr	Asp	Ile	Ser	Glu	Met	1875	1880	1885
Gly	Ala	Asn	Phe	Arg	Ala	Gly	Arg	Val	Ile	Asp	Pro	Arg	Arg	Cys	Leu	1890	1895	1900
Lys	Pro	Val	Ile	Leu	Pro	Asp	Gly	Pro	Glu	Arg	Val	Ile	Leu	Ala	Gly	1905	1910	1915
Pro	Ile	Pro	Val	Thr	Pro	Ala	Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	1925	1930	1935
Gly	Arg	Asn	Pro	Ala	Gln	Glu	Asp	Asp	Gln	Tyr	Val	Phe	Ser	Gly	Asp	1940	1945	1950
Pro	Leu	Lys	Asn	Asp	Glu	Asp	His	Ala	His	Trp	Thr	Glu	Ala	Lys	Met	1955	1960	1965
Leu	Leu	Asp	Asn	Ile	Tyr	Thr	Pro	Glu	Gly	Ile	Ile	Pro	Thr	Leu	Phe	1970	1975	1980
Gly	Pro	Glu	Arg	Glu	Lys	Thr	Gln	Ala	Ile	Asp	Gly	Glu	Phe	Arg	Leu	1985	1990	1995
Arg	Gly	Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Arg	Arg	Gly	Asp	2005	2010	2015
Leu	Pro	Val	Trp	Leu	Ser	Tyr	Lys	Val	Ala	Ser	Ala	Gly	Ile	Ser	Tyr	2020	2025	2030
Glu	Asp	Arg	Glu	Trp	Cys	Phe	Thr	Gly	Glu	Arg	Asn	Asn	Gln	Ile	Leu	2035	2040	2045
Glu	Glu	Asn	Met	Glu	Val	Glu	Ile	Trp	Thr	Arg	Glu	Gly	Glu	Lys	Lys			

2050				2055				2060							
Lys	Leu	Arg	Pro	Arg	Trp	Leu	Asp	Ala	Arg	Val	Tyr	Ala	Asp	Pro	Met
2065					2070					2075					2080
Ala	Leu	Lys	Asp	Phe	Lys	Glu	Phe	Ala	Ser	Gly	Arg	Lys	Ser	Ile	Thr
				2085						2090					2095
Leu	Asp	Ile	Leu	Thr	Glu	Ile	Ala	Ser	Leu	Pro	Thr	Tyr	Leu	Ser	Ser
			2100						2105				2110		
Arg	Ala	Lys	Leu	Ala	Leu	Asp	Asn	Ile	Val	Met	Leu	His	Thr	Thr	Glu
		2115				2120						2125			
Arg	Gly	Gly	Arg	Ala	Tyr	Gln	His	Ala	Leu	Asn	Glu	Leu	Pro	Glu	Ser
	2130				2135						2140				
Leu	Glu	Thr	Leu	Met	Leu	Val	Ala	Leu	Leu	Gly	Ala	Met	Thr	Ala	Gly
2145					2150					2155					2160
Ile	Phe	Leu	Phe	Phe	Met	Gln	Gly	Lys	Gly	Ile	Gly	Lys	Leu	Ser	Met
			2165						2170					2175	
Gly	Leu	Ile	Thr	Ile	Ala	Val	Ala	Ser	Gly	Leu	Leu	Trp	Val	Ala	Glu
			2180						2185				2190		
Ile	Gln	Pro	Gln	Trp	Ile	Ala	Ala	Ser	Ile	Ile	Leu	Glu	Phe	Phe	Leu
		2195					2200						2205		
Met	Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp
	2210				2215						2220				
Asn	Gln	Leu	Ile	Tyr	Val	Ile	Leu	Thr	Ile	Leu	Thr	Ile	Ile	Gly	Leu
2225					2230					2235					2240
Ile	Ala	Ala	Asn	Glu	Met	Gly	Leu	Ile	Glu	Lys	Thr	Lys	Thr	Asp	Phe
			2245						2250					2255	
Gly	Phe	Tyr	Gln	Val	Lys	Thr	Glu	Thr	Thr	Ile	Leu	Asp	Val	Asp	Leu
			2260						2265				2270		
Arg	Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr	Ala	Val	Ala	Thr	Thr	Ile	Leu
		2275				2280							2285		
Thr	Pro	Met	Leu	Arg	His	Thr	Ile	Glu	Asn	Thr	Ser	Ala	Asn	Leu	Ser
	2290				2295						2300				
Leu	Ala	Ala	Ile	Ala	Asn	Gln	Ala	Ala	Val	Leu	Met	Gly	Leu	Gly	Lys
2305					2310					2315					2320
Gly	Trp	Pro	Leu	His	Arg	Met	Asp	Leu	Gly	Val	Pro	Leu	Leu	Ala	Met
			2325						2330					2335	
Gly	Cys	Tyr	Ser	Gln	Val	Asn	Pro	Thr	Thr	Leu	Thr	Ala	Ser	Leu	Val
			2340						2345				2350		
Met	Leu	Leu	Val	His	Tyr	Ala	Ile	Gly	Pro	Gly	Leu	Gln	Ala	Lys	
		2355					2360				2365				
Ala	Thr	Arg	Glu	Ala	Gln	Lys	Arg	Thr	Ala	Ala	Gly	Ile	Met	Lys	Asn
	2370				2375						2380				
Pro	Thr	Val	Asp	Gly	Ile	Thr	Val	Ile	Asp	Leu	Glu	Pro	Ile	Ser	Tyr
2385					2390					2395					2400
Asp	Pro	Lys	Phe	Glu	Lys	Gln	Leu	Gly	Gln	Val	Met	Leu	Leu	Val	Leu
			2405						2410					2415	
Cys	Ala	Gly	Gln	Leu	Leu	Leu	Met	Arg	Thr	Thr	Trp	Ala	Phe	Cys	Glu
			2420						2425				2430		
Val	Leu	Thr	Leu	Ala	Thr	Gly	Pro	Ile	Leu	Thr	Leu	Trp	Glu	Gly	Asn
		2435				2440							2445		
Pro	Gly	Arg	Phe	Trp	Asn	Thr	Thr	Ile	Ala	Val	Ser	Thr	Ala	Asn	Ile
	2450				2455						2460				
Phe	Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Gly	Leu	Ala	Phe	Ser	Leu	Ile
2465					2470					2475					2480
Lys	Asn	Ala	Gln	Thr	Pro	Arg	Arg	Gly	Thr	Gly	Thr	Thr	Gly	Glu	Thr
			2485						2490					2495	
Leu	Gly	Glu	Lys	Trp	Lys	Arg	Gln	Leu	Asn	Ser	Leu	Asp	Arg	Lys	Glu
			2500						2505				2510		
Phe	Glu	Glu	Tyr	Lys	Arg	Ser	Gly	Ile	Leu	Glu	Val	Asp	Arg	Thr	Glu
		2515					2520					2525			
Ala	Lys	Ser	Ala	Leu	Lys	Asp	Gly	Ser	Lys	Ile	Lys	His	Ala	Val	Ser
	2530					2535					2540				

Arg Gly Ser Ser Lys Ile Arg Trp Ile Val Glu Arg Gly Met Val Lys  
 2545 2550 2555 2560  
 Pro Lys Gly Lys Val Val Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser  
 2565 2570 2575  
 Tyr Tyr Met Ala Thr Leu Lys Asn Val Thr Glu Val Lys Gly Tyr Thr  
 2580 2585 2590  
 Lys Gly Gly Pro Gly His Glu Glu Pro Ile Pro Met Ala Thr Tyr Gly  
 2595 2600 2605  
 Trp Asn Leu Val Lys Leu His Ser Gly Val Asp Val Phe Tyr Lys Pro  
 2610 2615 2620  
 Thr Glu Gln Val Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser  
 2625 2630 2635 2640  
 Asn Pro Thr Ile Glu Gly Arg Thr Leu Arg Val Leu Lys Met Val  
 2645 2650 2655  
 Glu Pro Trp Leu Ser Ser Lys Pro Glu Phe Cys Ile Lys Val Leu Asn  
 2660 2665 2670  
 Pro Tyr Met Pro Thr Val Ile Glu Glu Leu Glu Lys Leu Gln Arg Lys  
 2675 2680 2685  
 His Gly Gly Asn Leu Val Arg Cys Pro Leu Ser Arg Asn Ser Thr His  
 2690 2695 2700  
 Glu Met Tyr Trp Val Ser Gly Ala Ser Gly Asn Ile Val Ser Ser Val  
 2705 2710 2715 2720  
 Asn Thr Thr Ser Lys Met Leu Leu Asn Arg Phe Thr Thr Arg His Arg  
 2725 2730 2735  
 Lys Pro Thr Tyr Glu Lys Asp Val Asp Leu Gly Ala Gly Thr Arg Ser  
 2740 2745 2750  
 Val Ser Thr Glu Thr Glu Lys Pro Asp Met Thr Ile Ile Gly Arg Arg  
 2755 2760 2765  
 Leu Gln Arg Leu Gln Glu Glu His Lys Glu Thr Trp His Tyr Asp Gln  
 2770 2775 2780  
 Glu Asn Pro Tyr Arg Thr Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro  
 2785 2790 2795 2800  
 Ser Thr Gly Ser Ala Ser Ser Met Val Asn Gly Val Val Lys Leu Leu  
 2805 2810 2815  
 Thr Lys Pro Trp Asp Val Ile Pro Met Val Thr Gln Leu Ala Met Thr  
 2820 2825 2830  
 Asp Thr Thr Pro Phe Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp  
 2835 2840 2845  
 Thr Arg Thr Pro Gln Pro Lys Pro Gly Thr Arg Met Val Met Thr Thr  
 2850 2855 2860  
 Thr Ala Asn Trp Leu Trp Ala Leu Leu Gly Lys Lys Lys Asn Pro Arg  
 2865 2870 2875 2880  
 Leu Cys Thr Arg Glu Glu Phe Ile Ser Lys Val Arg Ser Asn Ala Ala  
 2885 2890 2895  
 Ile Gly Ala Val Phe Gln Glu Glu Gln Gly Trp Thr Ser Ala Ser Glu  
 2900 2905 2910  
 Ala Val Asn Asp Ser Arg Phe Trp Glu Leu Val Asp Lys Glu Arg Ala  
 2915 2920 2925  
 Leu His Gln Glu Gly Lys Cys Glu Ser Cys Val Tyr Asn Met Met Gly  
 2930 2935 2940  
 Lys Arg Glu Lys Lys Leu Gly Glu Phe Gly Arg Ala Lys Gly Ser Arg  
 2945 2950 2955 2960  
 Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu Glu Phe Glu Ala  
 2965 2970 2975  
 Leu Gly Phe Leu Asn Glu Asp His Trp Phe Gly Arg Glu Asn Ser Trp  
 2980 2985 2990  
 Ser Gly Val Glu Gly Glu Gly Leu His Arg Leu Gly Tyr Ile Leu Glu  
 2995 3000 3005  
 Glu Ile Asp Lys Lys Asp Gly Asp Leu Met Tyr Ala Asp Asp Thr Ala  
 3010 3015 3020  
 Gly Trp Asp Thr Arg Ile Thr Glu Asp Asp Leu Gln Asn Glu Glu Leu

3025					3030					3035				3040
Ile Thr Glu Gln Met	Ala Pro His His	Lys Ile Leu Ala Lys	Ala Ile											
	3045				3050								3055	
Phe Lys Leu Thr Tyr	Gln Asn Lys Val	Val Lys Val Leu Arg	Pro Thr											
	3060				3065								3070	
Pro Arg Gly Ala Val	Met Asp Ile Ile	Ser Arg Lys Asp	Gln Arg Gly											
	3075				3080								3085	
Ser Gly Gln Val Gly	Thr Tyr Gly Leu	Asn Thr Phe Thr	Asn Met Glu											
	3090				3095								3100	
Val Gln Leu Ile Arg	Gln Met Glu Ala	Glu Gly Val Ile	Thr Gln Asp											
3105				3110									3115	
Asp Met Gln Asn Pro	Lys Gly Leu Lys	Glu Arg Val Glu	Lys Trp Leu											
	3125				3130								3135	
Lys Glu Cys Gly Val	Asp Arg Leu Lys	Arg Met Ala Ile	Ser Gly Asp											
	3140				3145								3150	
Asp Cys Val Val Lys	Pro Leu Asp Glu	Arg Phe Gly Thr	Ser Leu Leu											
	3155				3160								3165	
Phe Leu Asn Asp Met	Gly Lys Val Arg	Lys Asp Ile Pro	Gln Trp Glu											
	3170				3175								3180	
Pro Ser Lys Gly Trp	Lys Asn Trp Gln	Glu Val Pro Phe	Cys Ser His											
3185				3190									3195	
His Phe His Lys Ile	Phe Met Lys Asp	Gly Arg Ser Leu	Val Val Pro											
	3205				3210								3215	
Cys Arg Asn Gln Asp	Glu Leu Ile Gly	Arg Ala Arg Ile	Ser Gln Gly											
	3220				3225								3230	
Ala Gly Trp Ser Leu	Arg Glu Thr Ala	Cys Leu Gly Lys	Ala Tyr Ala											
	3235				3240								3245	
Gln Met Trp Ser Leu	Met Tyr Phe His	Arg Arg Asp Leu	Arg Leu Ala											
	3250				3255								3260	
Ser Met Ala Ile Cys	Ser Ala Val Pro	Thr Glu Trp Phe	Pro Thr Ser											
3265				3270									3275	
Arg Thr Thr Trp Ser	Ile His Ala His	His Gln Trp Met	Thr Thr Glu											
	3285				3290								3295	
Asp Met Leu Lys Val	Trp Asn Arg Val	Trp Ile Glu Asp	Asn Pro Asn											
	3300				3305								3310	
Met Thr Asp Lys Thr	Pro Val His Ser	Trp Glu Asp Ile	Pro Tyr Leu											
	3315				3320								3325	
Gly Lys Arg Glu Asp	Leu Trp Cys Gly	Ser Leu Ile Gly	Leu Ser Ser											
	3330				3335								3340	
Arg Ala Thr Trp Ala	Lys Asn Ile His	Thr Ala Ile Thr	Gln Val Arg											
3345				3350									3355	
Asn Leu Ile Gly Lys	Glu Glu Tyr Val	Asp Tyr Met Pro	Val Met Lys											
	3365				3370								3375	
Arg Tyr Ser Ala Pro	Ser Glu Ser Glu	Gly Val Leu												
	3380				3385									

<210> 18

<211> 10616

<212> DNA

<213> Recombinant dengue virus rDEN2/4d30

<400> 18

agttgttagt	ctgtgtggac	cgacaaggac	agttccaaat	cggaagcttg	cttaacacag	60
ttctaacagt	ttgtttgaat	agagagcaga	tctctgatga	ataaccaacg	aaaaaaggcg	120
agaaatacgc	ctttcaatat	gctgaaacgc	gagagaaacc	gcgtgtcgac	tgtacaacag	180
ctgacaaaga	gattctcact	tggaatgctg	cagggacgag	gaccattaaa	actgttcacg	240
gccctggtgg	cgttccttcg	tttcctaaca	atcccaccaa	cagcagggat	actgaagaga	300
tggggaacaa	ttaaaaaatc	aaaagccatt	aatgttttga	gagggttcag	gaaagagatt	360
ggaaggatgc	tgaacatctt	gaacaggaga	cgcagaactg	caggcatgat	cattatgctg	420
attccaacag	tgatggcggt	ccatttaacc	acacgtaacg	gagaaccaca	catgatcgtc	480



agtagacaag	agaaagggaa	aagtcttctg	tttaaaacag	aggatggtgt	gaacatgtgt	540
accctcatgg	ccatggacct	tggatgaattg	tgtgaagata	caatcacgta	caagtgtcct	600
cttctcaggc	agaatgaacc	agaagacata	gattgttggg	gcaactctac	gtccacatgg	660
gtaactttatg	ggacgtgtac	caccacagga	gaacacagaa	gagaaaaaag	atcagtggca	720
ctcgtttccac	atgtgggaat	gggactggag	acacgaactg	aaacatggat	gtcatcagaa	780
ggggcctgga	aacatgcccc	gagaattgaa	acttggatct	tgagacatcc	aggctttacc	840
ataatggcag	caatcctggc	atacaccata	ggaacgacac	atttccaaag	agccctgatt	900
ttcatcttac	tgacagctgt	cgctccttca	atgacaatgc	gttgcatagg	aatatcaa	960
agagactttg	tagaaggggt	ttcaggagga	agctgggttg	acatagtctt	agaacatgga	1020
agctgtgtga	cgacgatggc	aaaaaacaaa	ccaacattgg	atthttgaact	gataaaaaa	1080
gaagccaaac	aacctgccac	tctaaggaag	tactgtatag	aggcaaagct	gaccaacaca	1140
acaacagaat	ctcgtgccc	aacacaagga	gaacctagcc	taaatgaaga	gcaggacaaa	1200
aggttcgtct	gcaaacactc	catggtggag	agaggatggg	gaaatggatg	tggattat	1260
ggaaaaggag	catttgtgac	ctgtgctatg	ttcacatgca	aaaagaacat	ggaaggaaaa	1320
gtcgtgcaac	cagaaaactt	ggaatacacc	atttgtataa	cacctcactc	aggggaagag	1380
catgcagtcg	gaaatgacac	aggaaaacat	ggcaaggaaa	tcaaaataac	accacagagt	1440
tccatcacag	aagcagagtt	gacaggctat	ggcactgtca	cgatggagtg	ctctccgaga	1500
acgggcctcg	acttcaatga	gatggtgttg	ctgcaaatgg	aaaataaagc	ttggctggtg	1560
cacaggcaat	ggttcctaga	cctgccgttg	ccatggctgc	ccggagcgga	cacacaagga	1620
tcaaattgga	tacagaaaga	gacattggctc	actttcaaaa	atccccatgc	gaagaaacag	1680
gatgtttgtg	ttttgggatc	ccaagaaggg	gccatgcaca	cagcactcac	aggggccaca	1740
gaaatccaga	tgtctcagg	aaacttactg	ttcacaggac	atctcaagtg	caggctgagg	1800
atggacaaac	tacagctcaa	aggaatgtca	tactctatgt	gcacaggaaa	gtttaaagtt	1860
gtgaaggaaa	tagcagaaac	acaacatgga	acaatagtta	tcagagtaca	atatgaaggg	1920
gacggttctc	catgtaagat	cccttttgag	ataatggatt	tggaaaaaag	acatgtttta	1980
ggtcgcctga	ttacagtcaa	cccaatcgta	acagaaaaag	atagcccagt	caacatagaa	2040
gcagaacctc	cattcggaga	cagctacatc	atcataggag	tagagccggg	acaattgaag	2100
ctcaactggt	ttaagaaagg	aagttctatc	ggccaaatgt	ttgagacaac	aatgagggga	2160
gcgaagagaa	tggccatttt	aggtgacaca	gcttgggatt	ttggatccct	gggaggagt	2220
ttatcatcta	taggaaaggc	tctccaccaa	gttttcggag	caatctatgg	ggctgccttc	2280
agtgggtctc	catggactat	gaaaatcctc	ataggagtca	ttatcacatg	gataggaatg	2340
aactcgagga	acacttcaat	ggctatgacg	tgcatagctg	ttggaggaat	cactctgttt	2400
ctgggcttca	cagttcaagc	agacatgggt	tgtgtggcgt	catggagtgg	gaaagaattg	2460
aagtgtggaa	gcggaatttt	tgtggttgac	aacgtgcaca	cttgacaga	acagtacaaa	2520
tttcaaccag	agtccccagc	gagactagcg	tctgcaatat	taaatgccca	caaagatggg	2580
gtctgtggaa	ttagatcaac	cacgaggctg	gaaaatgtca	tgtggaagca	aataaccaac	2640
gagctaaact	atgttctctg	ggaaggagga	catgacctca	ctgtagtggc	tggggatgtg	2700
aaggggggtg	tgaccaaagg	caagagagca	ctcacacccc	cagtgaagtga	tctgaaatat	2760
tcatggaaga	catggggaag	agcaaaaatc	ttcaccccag	aagcaagaaa	tagcacattt	2820
ttaatagacg	gaccagacac	ctctgaatgc	cccaatgaac	gaagagcatg	gaactctctt	2880
gaggtggaag	actatggatt	tggcatgttc	acgaccaaca	tatggatgaa	attccgagaa	2940
ggaagttcag	aagtgtgtga	ccacagggtta	atgtcagctg	caattaaaga	tcagaaagct	3000
gtgcatgctg	acatgggtta	ttggatagag	agctcaaaaa	accagacctg	gcagatagag	3060
aaagcatctc	ttattgaagt	gaaaacatgt	ctgtggccca	agaccacac	actgtggagc	3120
aatggagtgc	tggaaagcca	gatgctcatt	ccaaaatcat	atgcggggcc	tttttcacag	3180
cacaattacc	gccagggcta	tgccacgcaa	accgtgggcc	catggcactt	aggcaaat	3240
gagatagact	ttggagaatg	ccccggaaca	acaqtcacaa	ttcaggagga	ttgtgacct	3300
agaggcccat	ctttgaggac	caccactgca	tctggaaaac	tagtcacgca	atggtgctgc	3360
cgctcctgca	cgatgcctcc	cttaagggtc	ttgggagaag	atgggtgctg	gtatgggatg	3420
gagattaggc	ccttgagtga	aaaagaagag	aacatggtca	aatcacaggt	gacggccgga	3480
cagggcacat	cagaaacttt	ttctatgggt	ctgttgtgcc	tgacctgtt	tgtggaagaa	3540
tgcttgagga	gaagagtcac	taggaaacac	atgatattag	ttgtggtgat	cactctttgt	3600
gctatcatcc	tgggaggcct	cacatggatg	gacttactac	gagccctcat	catgttgggg	3660
gacactatgt	ctggtagaat	aggaggacag	atccacctag	ccatcatggc	agtgttcaag	3720
atgtcaccag	gatacgtgct	gggtgtgttt	ttcaggaaac	tcacttcaag	agagacagca	3780
ctaattggtaa	taggaatggc	catgacaacg	gtgctttcaa	ttccacatga	ccttatggaa	3840
ctcattgatg	gaatatcact	gggactaatt	ttgctaaaaa	tagtaacaca	gtttgacaac	3900
acccaagtgg	gaaccttagc	tctttccttg	actttcataa	gatcaacaat	gccattgggtc	3960
atggcttgga	ggaccattat	ggctgtgttg	tttgtggcca	cactcattcc	tttgtgcagg	4020
acaagctgtc	ttcaaaaaca	gtctcatttg	gtagaaataa	cagcactcat	cctaggagcc	4080
caagctctgc	cagtgtacct	aatgactctt	atgaaaggag	cctcaagaag	atcttggcct	4140

cttaacgagg	gcataatggc	tgtggggttt	gttagtctct	taggaagcgc	tcttttaaaag	4200
aatgatgtcc	cttttagctgg	cccaatggtg	gcaggaggct	tacttctggc	ggcttacgtg	4260
atgagtggta	gctcagcaga	tctgtcacta	gagaaggccg	ccaacgtgca	gtgggatgaa	4320
atggcagaca	taacaggctc	aagcccaatc	atagaagtga	agcaggatga	agatggctct	4380
ttctccatac	gggacgtcga	ggaaaccaat	atgataaacc	ttttggtgaa	actggcactg	4440
ataacagtg	caggtctcta	ccccttggca	attccagtc	caatgacctt	atggtacatg	4500
tggcaagtga	aaacacaaag	atcaggagcc	ctgtgggacg	tcccctcacc	cgctgccact	4560
aaaaaagccg	cactgtctga	aggagtgtac	aggatcatgc	aaagagggtt	attcgggaaa	4620
actcaggttg	gagtagggat	acacatggaa	ggtgtatttc	acacaatgtg	gcatgtaaca	4680
agaggatcag	tgatctgcca	cgagactggg	agattggagc	catcttgggc	tgacgtcagg	4740
aatgacatga	tatcatacgg	tgggggatgg	aggcttggag	acaaatggga	caaagaagaa	4800
gacgttcagg	tcctcgccat	agaaccagga	aaaaatccta	aacatgtcca	aacgaaacct	4860
ggccttttca	agaccctaac	tggagaaatt	ggagcagtaa	cattagattt	caaaccggga	4920
acgtctgggt	ctcccatcat	caacaggaaa	ggaaaagtca	tcggactcta	tggaaatgga	4980
gtagttagca	aatcaggtga	ttacgtcagt	gccataacgc	aagccgaaag	aattggagag	5040
ccagattatg	aagtggatga	ggacattttt	cgaaagaaaa	gattaactat	aatggactta	5100
caccccgagg	ctggaaagac	aaaaagaatt	cttccatcaa	tagtgagaga	agccttaaaa	5160
aggaggctac	gaactttgat	tttagctccc	acgagagtgg	tggcggccga	gatggaagag	5220
gccctacgtg	gactgccaat	ccgttatcag	accccagctg	tgaaatcaga	acacacagga	5280
agagagattg	tagacctcat	gtgtcatgca	accttcacaa	caagactttt	gtcatcaacc	5340
agggttccaa	attacaacct	tatagtgtag	gatgaagcac	atttcaccga	tccttctagt	5400
gtcgcggcta	ctcgaccagg	ctcgaccagg	gtggaatgg	gagaggcagc	agccatcttc	5460
atgaccgcaa	cccctcccgg	agcgacagat	ccctttcccc	agagcaacag	cccaatagaa	5520
gacatcgaga	gggaaattcc	ggaaagggtca	tggaaacacag	ggttcgactg	gataacagac	5580
taccaaggga	aaactgtgtg	gtttgttccc	agcataaaaag	ctggaaatga	cattgcaa	5640
tgtttgagaa	agtcgggaaa	gaaagtatatc	cagttgagta	ggaaaacctt	tgatacagag	5700
tatccaaaaa	cgaaactcac	ggactgggac	tttgtggtca	ctacagacat	atctgaaatg	5760
ggggccaatt	ttagagccgg	gagagtgata	gaccctagaa	gatgcctcaa	gccagttatc	5820
ctaccagatg	ggccagagag	agtcatttta	gcaggctcta	ttccagtgc	ttccagcaagc	5880
gctgctcaga	gaagagggcg	aataggaagc	aaccagcac	aagaagacga	ccaatcgtt	5940
ttctccggag	accactaaa	aaatgatgaa	gatcatgccc	actggacaga	agcaaagatg	6000
ctgcttgaca	atatctacac	cccagaaggg	atcattccaa	cattgttttg	tccggaaagg	6060
gaaaaaacc	aagccattga	tggagagttt	cgctcagag	gggaacaaag	gaagactttt	6120
gtggaattaa	tgaggagagg	agaccttccg	gtgtggctga	gctataaggt	agcttctgct	6180
ggcatttctt	acaaagatcg	ggaatggtgc	ttcacagggg	aaagaaataa	ccaaatttta	6240
gaagaaaaca	tggaggttga	aatttggact	agagaggggag	aaaagaaaaa	gctaaggcca	6300
agatggttag	atgcacgtgt	atacgtgcac	cccattggctt	tgaaggattt	caaggagttt	6360
gccagtggaa	ggaagagtat	aactctgcac	atcctaacag	agattgccag	tttgccaagt	6420
tacctttcct	ctagggccaa	gctcgccctt	gataacatag	tcattgctcca	cacaacagaa	6480
agaggaggga	gggcctatca	acacgccctg	aacgaacttc	cggagtccact	ggaaacactc	6540
atgcttgtag	ctttactagg	tgctatgaca	gcaggcatct	tcctgttttt	catgcaaggg	6600
aaaggaatag	ggaaattgtc	aatgggtttg	ataaccattg	cggtggctag	tggcttgctc	6660
tgggtagcag	aaattcaacc	ccagtggata	gcggcctcaa	tcatactaga	gttttttctc	6720
atggtactgt	tgataccgga	accagaaaaa	caaaggaccc	cacaagacaa	tcaattgatc	6780
tacgtcatat	tgaccattct	caccatcatt	ggtctaatag	cagccaacga	gatggggctg	6840
attgaaaaaa	caaaaacgga	ttttgggttt	taccaggtaa	aaacagaaac	caccatcctc	6900
gatgtggact	tgagaccagc	ttcagcatgg	acgtctctatg	cagttagccac	cacaattctg	6960
actcccattgc	tgagacacac	catagaaaac	acgtcggcca	acctatctct	agcagccatt	7020
gccaaccagg	cagccgtcct	aatggggctt	ggaaaaggat	ggccgctcca	cagaatggac	7080
ctcgggtgtgc	cgctgttagc	aatgggatgc	tattctcaag	tgaaccaac	aaccttgaca	7140
gcatccttag	tcattgctttt	agtcatttat	gcaataatag	gccaggattt	gcaggcaaaa	7200
gccacaagag	aggcccagaa	aaggacagct	gctgggatca	tgaaaaatcc	cacagtggac	7260
gggataacag	taatagatct	agaaccaata	tcctatgacc	caaaatttga	aaagcaatta	7320
gggcaggtca	tgtactagt	cttgtgtgct	ggacaactac	tcttgatgag	aacaacatgg	7380
gcttttctgtg	aagtcttgac	tttggccaca	ggaccaatct	tgaccttgtg	ggagggcaac	7440
ccgggaaggt	tttgaacac	gaccatagcc	gtatccaccg	ccaacatttt	caggggaagt	7500
tacttggcgg	gagctggact	ggctttttca	ctcataaaga	atgcacaaac	ccctaggagg	7560
ggaactggga	ccacaggaga	gacactggga	gagaagtggg	agagacagct	aaactcatta	7620
gacagaaaag	agtttgaaga	gtataaaaaga	agtggaaatc	tagaagtggg	caggactgaa	7680
gccaaagtctg	ccctgaaaga	tgggtctaaa	atcaagcatg	cagtatcaag	agggctccagt	7740
aagatcagat	ggattgttga	gagagggatg	gtaaagccaa	aagggaaggt	tgtagatctt	7800

ggctgtggga	gaggaggatg	gtcttattac	atggcgacac	tcaagaacgt	gactgaagtg	7860
aaaggggtata	caaaaaggagg	tccaggacat	gaagaaccga	ttcccatggc	tacttatggg	7920
tggaattttg	tcaaactcca	ttcaggggtt	gacgtgttct	acaaacccac	agagcaagtg	7980
gacaccctgc	tctgtgatat	tggggagtca	tcttctaate	caacaataga	ggaaggaaga	8040
acattaagag	ttttgaagat	ggtggagcca	tggctctctt	caaaacctga	attctgcac	8100
aaagtcctta	acccctacat	gccaacagtc	atagaagagc	tggagaaact	gcagagaaaa	8160
catggtggga	accttgtcag	atgcccgtg	tccaggaact	ccacccatga	gatgtattgg	8220
gtgtcaggag	cgtcgggaaa	cattgtgagc	tctgtgaaca	caacatcaaa	gatgttggg	8280
aacaggttca	caacaaggca	taggaaaccc	acttatgaga	aggacgtaga	tcttggggca	8340
ggaacgagaa	gtgtctccac	tgaacagaa	aaaccagaca	tgacaatcat	tgggagaagg	8400
cttcagcgat	tgcaagaaga	gcacaaagaa	acctggcatt	atgatcagga	aaaccatac	8460
agaacctggg	cgtatcatgg	aagctatgaa	gctccttcga	caggctctgc	atcctccatg	8520
gtgaacgggg	tggtaaaact	gctaacaaaa	ccctgggatg	tgattccaat	ggtgactcag	8580
ttagccatga	cagatacaac	cccttttggg	caacaaagag	tgttcaaaga	gaaggtggat	8640
accagaacac	cacaaccaa	acccggtaca	cgaatggtta	tgaccacgac	agccaattgg	8700
ctgtggggccc	tccttgga	gaagaaaaat	cccagactgt	gcacaaggga	agagtccatc	8760
tcaaaagtta	gatcaaagc	agccataggc	gcagtctttc	aggaagaaca	gggatggaca	8820
tcagccagtg	aagctgtgaa	tgacagccgg	ttttgggaac	tgggtgacaa	agaaagggcc	8880
ctacaccagg	aagggaaatg	tgaatcgtgt	gtctataaca	tgatgggaaa	acgtgagaaa	8940
aagttaggag	agtttggcag	agccaaggga	agccgagcaa	tctggtacat	gtggctggga	9000
gcgcggtttc	tggaaattga	agccctgggt	tttttgaatg	aagatcactg	gtttggcaga	9060
gaaaattcat	ggagtggagt	ggaaggggaa	ggtctgcaca	gattgggata	tatcctggag	9120
gagatagaca	agaaggtatg	agacctaatg	tatgctgatg	acacagcagg	ctgggacaca	9180
agaatcactg	aggatgacct	tcaaaatgag	gaactgatca	cggaacagat	ggctccccac	9240
cacaagatcc	tagccaaagc	cattttcaaa	ctaacctatc	aaaacaaagt	ggtgaaagtc	9300
ctcagaccca	caccgcgggg	agcgggtgatg	gatatcatat	ccaggaaaga	ccaaagaggt	9360
agtggacaag	ttggaacata	tggtttgaac	acattcacca	acatggaagt	tcaactcatc	9420
cgccaaatgg	aagctgaagg	agtcatcaca	caagatgaca	tgagaacccc	aaaagggttg	9480
aaagaaagag	ttgagaaatg	gctgaaagag	tgtggtgtcg	acaggttaaa	gaggatggca	9540
atcagtggag	acgattgcgt	ggtgaagccc	ctagatgaga	ggtttggcac	ttccctcctc	9600
ttcttgaacg	acatgggaaa	ggtgaggaaa	gacattccgc	agtgggaacc	atctaaggga	9660
tggaaaaact	ggcaagaggt	tcctttttgc	tcccaccact	ttcacaagat	ctttatgaag	9720
gatggccgct	cactagtgtg	tccatgtaga	aaccaggatg	aactgatagg	gagagccaga	9780
atctcgcagg	gagctggatg	gagcttaaga	gaaacagcct	gcctgggcaa	agcttacgcc	9840
cagatgtggt	cgcttatgta	cttcacaga	agggatctgc	gtttagcctc	catggccata	9900
tgctcagcag	ttccaacgga	atggtttcca	acaagcagaa	caacatggtc	aatccacgct	9960
catcaccagt	ggatgaccac	tgaagatatg	ctcaaagtgt	ggaacagagt	gtggatagaa	10020
gacaacccta	atatgactga	caagactcca	gtccattcgt	gggaagatat	accttaccta	10080
gggaaaagag	aggattttg	gtgtggatcc	gtgattggac	tttcttccag	agccacctgg	10140
gcgaagaaca	ttcacacggc	cataaccag	gtcaggaacc	tgatcgga	agaggaatac	10200
gtggattaca	tgccagtaat	gaaaagatac	agtgtctcct	cagagagtga	aggagtctctg	10260
taattaccaa	caacaaacac	caaaggctat	tgaagtcagg	ccacttgtgc	cacggtttga	10320
gcaaaccgtg	ctgcctgtag	ctccgccaat	aatgggaggc	gtaataatcc	ccagggaggc	10380
catgcgccac	ggaagctgta	cgcggtggcat	attggactag	cggttagagg	agaccctcc	10440
catcactgac	aaaacgcagc	aaaagggggc	ccaagactag	aggttagagg	agaccccccc	10500
aacacaaaaa	cagcatattg	acgctgggaa	agaccagaga	tcctgctgtc	tctgcaacat	10560
caatccaggc	acagagcgcc	gcaagatgga	ttggtgttgt	tgatccaaca	ggttct	10616

<210> 19

<211> 3387

<212> PRT

<213> Dengue 4 virus

<400> 19

Met	Asn	Gln	Arg	Lys	Lys	Val	Val	Arg	Pro	Pro	Phe	Asn	Met	Leu	Lys
1				5					10					15	
Arg	Glu	Arg	Asn	Arg	Val	Ser	Thr	Pro	Gln	Gly	Leu	Val	Lys	Arg	Phe
			20					25					30		
Ser	Thr	Gly	Leu	Phe	Ser	Gly	Lys	Gly	Pro	Leu	Arg	Met	Val	Leu	Ala
		35					40					45			
Phe	Ile	Thr	Phe	Leu	Arg	Val	Leu	Ser	Ile	Pro	Pro	Thr	Ala	Gly	Ile

50					55					60					
Leu 65	Lys	Arg	Trp	Gly	Gln 70	Leu	Lys	Lys	Asn	Lys 75	Ala	Ile	Lys	Ile	Leu 80
Ile 65	Gly	Phe	Arg	Lys 85	Glu 70	Ile	Gly	Arg	Met 90	Leu 75	Asn	Ile	Leu	Asn 95	Gly 80
Arg 65	Lys	Arg	Ser 100	Thr 85	Ile 70	Thr	Leu	Leu 105	Cys 90	Leu 75	Ile	Pro	Thr 110	Val 95	Met 80
Ala 65	Phe	Ser 115	Leu 100	Ser 85	Thr 70	Arg	Asp 120	Gly 105	Glu 90	Pro 75	Leu	Met 125	Ile 110	Val 95	Ala 80
Lys 65	His 130	Glu	Arg	Gly 85	Arg 70	Pro	Leu	Leu 135	Phe 90	Lys 75	Thr 140	Thr	Glu 110	Gly 95	Ile 80
Asn 145	Lys	Cys	Thr	Leu 150	Ile 70	Ala	Met	Asp	Leu 155	Gly 75	Glu	Met	Cys	Glu 95	Asp 80
Thr 145	Val	Thr	Tyr	Lys 165	Cys 70	Pro	Leu	Leu 170	Val 90	Asn 75	Thr	Glu	Pro	Glu 95	Asp 80
Ile 145	Asp	Cys	Trp 180	Cys 165	Asn 70	Leu	Thr	Ser 185	Thr 90	Trp 75	Val	Met	Tyr 190	Gly 95	Thr 80
Cys 145	Thr	Gln	Ser 195	Gly 180	Glu 70	Arg	Arg	Arg 200	Glu 90	Lys 75	Arg	Ser 205	Val 190	Ala 95	Leu 80
Thr 145	Pro	His	Ser 210	Gly 195	Met 70	Gly	Leu	Glu 215	Thr 90	Arg 75	Ala	Glu	Thr 220	Trp 95	Met 80
Ser 145	Ser	Glu	Gly	Ala 230	Trp 70	Lys	His	Ala	Gln 235	Arg 75	Val	Glu	Ser 240	Trp 95	Ile 80
Leu 145	Arg	Asn	Pro	Gly 245	Phe 70	Ala	Leu	Leu 250	Ala 90	Gly 75	Phe	Met	Ala 255	Tyr 95	Met 80
Ile 145	Gly	Gln	Thr 260	Gly 245	Ile 70	Gln	Arg	Thr 265	Val 90	Phe 75	Phe	Val	Leu 270	Met 95	Met 80
Leu 145	Val	Ala	Pro 275	Ser 260	Tyr 70	Gly	Met	Arg 280	Cys 90	Val 75	Gly	Val	Gly 285	Asn 95	Arg 80
Asp 145	Phe	Val	Glu	Gly 290	Val 70	Ser	Gly	Gly 295	Ala 90	Trp 75	Val	Asp	Leu 300	Val 95	Leu 80
Glu 145	His	Gly	Gly	Cys 305	Val 70	Thr	Thr	Met	Ala 315	Gln 75	Gly	Lys	Pro	Thr 320	Leu 80
Asp 145	Phe	Glu	Leu	Thr 325	Lys 70	Thr	Thr	Ala	Lys 330	Glu 75	Val	Ala	Leu 335	Leu 95	Arg 80
Thr 145	Tyr	Cys	Ile 340	Glu 325	Ala 70	Ser	Ile	Ser 345	Asn 90	Ile 75	Thr	Thr	Ala 350	Thr 95	Arg 80
Cys 145	Pro	Thr	Gln 355	Gly 340	Glu 70	Pro	Tyr	Leu 360	Lys 90	Glu 75	Glu	Gln	Asp 365	Gln 95	Gln 80
Tyr 145	Ile	Cys	Arg	Arg 370	Asp 70	Val	Val	Asp 375	Arg 90	Gly 75	Trp	Gly	Asn 380	Gly 95	Cys 80
Gly 145	Leu	Phe	Gly	Lys 385	Gly 70	Gly	Val	Val 390	Thr 90	Cys 75	Ala	Lys	Phe	Ser 400	Cys 80
Ser 145	Gly	Lys	Ile 405	Thr 385	Gly 70	Asn	Leu	Val 410	Gln 90	Ile 75	Glu	Asn	Leu 415	Glu 95	Tyr 80
Thr 145	Val	Val	Val 420	Thr 405	Val 70	His	Asn	Gly 425	Asp 90	Thr 75	His	Ala	Val 430	Gly 95	Asn 80
Asp 145	Thr	Ser	Asn 435	His 420	Gly 70	Val	Thr	Ala 440	Met 90	Ile 75	Thr	Pro	Arg 445	Ser 95	Pro 80
Ser 145	Val	Glu	Val	Lys 450	Leu 70	Pro	Asp	Tyr 455	Gly 90	Glu 75	Leu	Thr	Leu 460	Asp 95	Cys 80
Glu 145	Pro	Arg	Ser	Gly 465	Ile 70	Asp	Phe	Asn 470	Glu 90	Met 75	Ile	Leu	Met 475	Lys 95	Met 80
Lys 145	Lys	Lys	Thr 485	Trp 465	Leu 70	Val	His	Lys 490	Gln 90	Trp 75	Phe	Leu	Asp 495	Leu 95	Pro 80
Leu 145	Pro	Trp	Thr 500	Ala 485	Gly 70	Ala	Asp	Thr 505	Ser 90	Glu 75	Val	His	Trp 510	Asn 95	Tyr 80
Lys 145	Glu	Arg	Met 515	Val 500	Thr 70	Phe	Lys	Val 520	Pro 90	His 75	Ala	Lys	Arg 525	Gln 95	Asp 80
Val 145	Thr	Val	Leu	Gly 530	Ser 70	Gln	Glu	Gly 535	Ala 90	Met 75	His	Ser	Ala 540	Leu 95	Ala 80

Gly	Ala	Thr	Glu	Val	Asp	Ser	Gly	Asp	Gly	Asn	His	Met	Phe	Ala	Gly
545					550					555					560
His	Leu	Lys	Cys	Lys	Val	Arg	Met	Glu	Lys	Leu	Arg	Ile	Lys	Gly	Met
				565					570					575	
Ser	Tyr	Thr	Met	Cys	Ser	Gly	Lys	Phe	Ser	Ile	Asp	Lys	Glu	Met	Ala
			580					585					590		
Glu	Thr	Gln	His	Gly	Thr	Thr	Val	Val	Lys	Val	Lys	Tyr	Glu	Gly	Ala
		595					600					605			
Gly	Ala	Pro	Cys	Lys	Val	Pro	Ile	Glu	Ile	Arg	Asp	Val	Asn	Lys	Glu
	610					615					620				
Lys	Val	Val	Gly	Arg	Ile	Ile	Ser	Ser	Thr	Pro	Leu	Ala	Glu	Asn	Thr
625					630					635					640
Asn	Ser	Val	Thr	Asn	Ile	Glu	Leu	Glu	Pro	Pro	Phe	Gly	Asp	Ser	Tyr
				645					650					655	
Ile	Val	Ile	Gly	Val	Gly	Asn	Ser	Ala	Leu	Thr	Leu	His	Trp	Phe	Arg
			660					665					670		
Lys	Gly	Ser	Ser	Ile	Gly	Lys	Met	Phe	Glu	Ser	Thr	Tyr	Arg	Gly	Ala
		675					680					685			
Lys	Arg	Met	Ala	Ile	Leu	Gly	Glu	Thr	Ala	Trp	Asp	Phe	Gly	Ser	Val
	690					695					700				
Gly	Gly	Leu	Phe	Thr	Ser	Leu	Gly	Lys	Ala	Val	His	Gln	Val	Phe	Gly
705					710					715					720
Ser	Val	Tyr	Thr	Thr	Met	Phe	Gly	Gly	Val	Ser	Trp	Met	Ile	Arg	Ile
				725					730					735	
Leu	Ile	Gly	Phe	Leu	Val	Leu	Trp	Ile	Gly	Thr	Asn	Ser	Arg	Asn	Thr
			740					745					750		
Ser	Met	Ala	Met	Thr	Cys	Ile	Ala	Val	Gly	Gly	Ile	Thr	Leu	Phe	Leu
		755					760					765			
Gly	Phe	Thr	Val	Gln	Ala	Asp	Met	Gly	Cys	Val	Ala	Ser	Trp	Ser	Gly
	770					775					780				
Lys	Glu	Leu	Lys	Cys	Gly	Ser	Gly	Ile	Phe	Val	Val	Asp	Asn	Val	His
785					790					795					800
Thr	Trp	Thr	Glu	Gln	Tyr	Lys	Phe	Gln	Pro	Glu	Ser	Pro	Ala	Arg	Leu
				805					810					815	
Ala	Ser	Ala	Ile	Leu	Asn	Ala	His	Lys	Asp	Gly	Val	Cys	Gly	Ile	Arg
			820					825					830		
Ser	Thr	Thr	Arg	Leu	Glu	Asn	Val	Met	Trp	Lys	Gln	Ile	Thr	Asn	Glu
		835					840					845			
Leu	Asn	Tyr	Val	Leu	Trp	Glu	Gly	Gly	His	Asp	Leu	Thr	Val	Val	Ala
		850				855					860				
Gly	Asp	Val	Lys	Gly	Val	Leu	Thr	Lys	Gly	Lys	Arg	Ala	Leu	Thr	Pro
865					870					875					880
Pro	Val	Ser	Asp	Leu	Lys	Tyr	Ser	Trp	Lys	Thr	Trp	Gly	Lys	Ala	Lys
				885					890					895	
Ile	Phe	Thr	Pro	Glu	Ala	Arg	Asn	Ser	Thr	Phe	Leu	Ile	Asp	Gly	Pro
			900					905					910		
Asp	Thr	Ser	Glu	Cys	Pro	Asn	Glu	Arg	Arg	Ala	Trp	Asn	Ser	Leu	Glu
			915				920					925			
Val	Glu	Asp	Tyr	Gly	Phe	Gly	Met	Phe	Thr	Thr	Asn	Ile	Trp	Met	Lys
	930					935					940				
Phe	Arg	Glu	Gly	Ser	Ser	Glu	Val	Cys	Asp	His	Arg	Leu	Met	Ser	Ala
945					950					955					960
Ala	Ile	Lys	Asp	Gln	Lys	Ala	Val	His	Ala	Asp	Met	Gly	Tyr	Trp	Ile
				965					970					975	
Glu	Ser	Ser	Lys	Asn	Gln	Thr	Trp	Gln	Ile	Glu	Lys	Ala	Ser	Leu	Ile
			980					985					990		
Glu	Val	Lys	Thr	Cys	Leu	Trp	Pro	Lys	Thr	His	Thr	Leu	Trp	Ser	Asn
		995					1000					1005			
Gly	Val	Leu	Glu	Ser	Gln	Met	Leu	Ile	Pro	Lys	Ser	Tyr	Ala	Gly	Pro
	1010					1015					1020				
Phe	Ser	Gln	His	Asn	Tyr	Arg	Gln	Gly	Tyr	Ala	Thr	Gln	Thr	Val	Gly

1025					1030					1035				1040
Pro	Trp	His	Leu	Gly	Lys	Leu	Glu	Ile	Asp	Phe	Gly	Glu	Cys	Pro Gly
				1045					1050					1055
Thr	Thr	Val	Thr	Ile	Gln	Glu	Asp	Cys	Asp	His	Arg	Gly	Pro	Ser Leu
				1060					1065					1070
Arg	Thr	Thr	Thr	Ala	Ser	Gly	Lys	Leu	Val	Thr	Gln	Trp	Cys	Cys Arg
				1075					1080					1085
Ser	Cys	Thr	Met	Pro	Pro	Leu	Arg	Phe	Leu	Gly	Glu	Asp	Gly	Cys Trp
				1090					1095					1100
Tyr	Gly	Met	Glu	Ile	Arg	Pro	Leu	Ser	Glu	Lys	Glu	Glu	Asn	Met Val
1105										1110				1120
Lys	Ser	Gln	Val	Thr	Ala	Gly	Gln	Gly	Thr	Ser	Glu	Thr	Phe	Ser Met
										1115				1130
Gly	Leu	Leu	Cys	Leu	Thr	Leu	Phe	Val	Glu	Glu	Cys	Leu	Arg	Arg Arg
										1135				1150
Val	Thr	Arg	Lys	His	Met	Ile	Leu	Val	Val	Val	Ile	Thr	Leu	Cys Ala
										1140				1160
Ile	Ile	Leu	Gly	Gly	Leu	Thr	Trp	Met	Asp	Leu	Leu	Arg	Ala	Leu Ile
										1145				1170
Met	Leu	Gly	Asp	Thr	Met	Ser	Gly	Arg	Ile	Gly	Gly	Gln	Ile	His Leu
1185										1155				1200
Ala	Ile	Met	Ala	Val	Phe	Lys	Met	Ser	Pro	Gly	Tyr	Val	Leu	Gly Val
										1165				1215
Phe	Leu	Arg	Lys	Leu	Thr	Ser	Arg	Glu	Thr	Ala	Leu	Met	Val	Ile Gly
										1175				1230
Met	Ala	Met	Thr	Thr	Val	Leu	Ser	Ile	Pro	His	Asp	Leu	Met	Glu Leu
										1180				1245
Ile	Asp	Gly	Ile	Ser	Leu	Gly	Leu	Ile	Leu	Leu	Lys	Ile	Val	Thr Gln
										1185				1260
Phe	Asp	Asn	Thr	Gln	Val	Gly	Thr	Leu	Ala	Leu	Ser	Leu	Thr	Phe Ile
1265										1190				1280
Arg	Ser	Thr	Met	Pro	Leu	Val	Met	Ala	Trp	Arg	Thr	Ile	Met	Ala Val
										1195				1295
Leu	Phe	Val	Val	Thr	Leu	Ile	Pro	Leu	Cys	Arg	Thr	Ser	Cys	Leu Gln
										1200				1310
Lys	Gln	Ser	His	Trp	Val	Glu	Ile	Thr	Ala	Leu	Ile	Leu	Gly	Ala Gln
										1205				1325
Ala	Leu	Pro	Val	Tyr	Leu	Met	Thr	Leu	Met	Lys	Gly	Ala	Ser	Arg Arg
										1210				1340
Ser	Trp	Pro	Leu	Asn	Glu	Gly	Ile	Met	Ala	Val	Gly	Leu	Val	Ser Leu
1345										1215				1360
Leu	Gly	Ser	Ala	Leu	Leu	Lys	Asn	Asp	Val	Pro	Leu	Ala	Gly	Pro Met
										1220				1375
Val	Ala	Gly	Gly	Leu	Leu	Leu	Ala	Ala	Tyr	Val	Met	Ser	Gly	Ser Ser
										1225				1390
Ala	Asp	Leu	Ser	Leu	Glu	Lys	Ala	Ala	Asn	Val	Gln	Trp	Asp	Glu Met
										1230				1405
Ala	Asp	Ile	Thr	Gly	Ser	Ser	Pro	Ile	Ile	Glu	Val	Lys	Gln	Asp Glu
										1235				1420
Asp	Gly	Ser	Phe	Ser	Ile	Arg	Asp	Val	Glu	Glu	Thr	Asn	Met	Ile Thr
1425										1240				1440
Leu	Leu	Val	Lys	Leu	Ala	Leu	Ile	Thr	Val	Ser	Gly	Leu	Tyr	Pro Leu
										1245				1455
Ala	Ile	Pro	Val	Thr	Met	Thr	Leu	Trp	Tyr	Met	Trp	Gln	Val	Lys Thr
										1250				1470
Gln	Arg	Ser	Gly	Ala	Leu	Trp	Asp	Val	Pro	Ser	Pro	Ala	Ala	Thr Lys
										1255				1485
Lys	Ala	Ala	Leu	Ser	Glu	Gly	Val	Tyr	Arg	Ile	Met	Gln	Arg	Gly Leu
										1260				1500
Phe	Gly	Lys	Thr	Gln	Val	Gly	Val	Gly	Ile	His	Met	Glu	Gly	Val Phe
1505										1265				1515
										1270				1520

His	Thr	Met	Trp	His	Val	Thr	Arg	Gly	Ser	Val	Ile	Cys	His	Glu	Thr	1525	1530	1535
Gly	Arg	Leu	Glu	Pro	Ser	Trp	Ala	Asp	Val	Arg	Asn	Asp	Met	Ile	Ser	1540	1545	1550
Tyr	Gly	Gly	Gly	Trp	Arg	Leu	Gly	Asp	Lys	Trp	Asp	Lys	Glu	Glu	Asp	1555	1560	1565
Val	Gln	Val	Leu	Ala	Ile	Glu	Pro	Gly	Lys	Asn	Pro	Lys	His	Val	Gln	1570	1575	1580
Thr	Lys	Pro	Gly	Leu	Phe	Lys	Thr	Leu	Thr	Gly	Glu	Ile	Gly	Ala	Val	1585	1590	1595
Thr	Leu	Asp	Phe	Lys	Pro	Gly	Thr	Ser	Gly	Ser	Pro	Ile	Ile	Asn	Arg	1605	1610	1615
Lys	Gly	Lys	Val	Ile	Gly	Leu	Tyr	Gly	Asn	Gly	Val	Val	Thr	Lys	Ser	1620	1625	1630
Gly	Asp	Tyr	Val	Ser	Ala	Ile	Thr	Gln	Ala	Glu	Arg	Ile	Gly	Glu	Pro	1635	1640	1645
Asp	Tyr	Glu	Val	Asp	Glu	Asp	Ile	Phe	Arg	Lys	Lys	Arg	Leu	Thr	Ile	1650	1655	1660
Met	Asp	Leu	His	Pro	Gly	Ala	Gly	Lys	Thr	Lys	Arg	Ile	Leu	Pro	Ser	1665	1670	1675
Ile	Val	Arg	Glu	Ala	Leu	Lys	Arg	Arg	Leu	Arg	Thr	Leu	Ile	Leu	Ala	1685	1690	1695
Pro	Thr	Arg	Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Leu	Arg	Gly	Leu	1700	1705	1710
Pro	Ile	Arg	Tyr	Gln	Thr	Pro	Ala	Val	Lys	Ser	Glu	His	Thr	Gly	Arg	1715	1720	1725
Glu	Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Thr	Arg	Leu	Leu	1730	1735	1740
Ser	Ser	Thr	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Ile	Val	Met	Asp	Glu	Ala	1745	1750	1755
His	Phe	Thr	Asp	Pro	Ser	Ser	Val	Ala	Ala	Arg	Gly	Tyr	Ile	Ser	Thr	1765	1770	1775
Arg	Val	Glu	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	Ala	Thr	Pro	1780	1785	1790
Pro	Gly	Ala	Thr	Asp	Pro	Phe	Pro	Gln	Ser	Asn	Ser	Pro	Ile	Glu	Asp	1795	1800	1805
Ile	Glu	Arg	Glu	Ile	Pro	Glu	Arg	Ser	Trp	Asn	Thr	Gly	Phe	Asp	Trp	1810	1815	1820
Ile	Thr	Asp	Tyr	Gln	Gly	Lys	Thr	Val	Trp	Phe	Val	Pro	Ser	Ile	Lys	1825	1830	1835
Ala	Gly	Asn	Asp	Ile	Ala	Asn	Cys	Leu	Arg	Lys	Ser	Gly	Lys	Lys	Val	1845	1850	1855
Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe	Asp	Thr	Glu	Tyr	Pro	Lys	Thr	Lys	1860	1865	1870
Leu	Thr	Asp	Trp	Asp	Phe	Val	Val	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly	1875	1880	1885
Ala	Asn	Phe	Arg	Ala	Gly	Arg	Val	Ile	Asp	Pro	Arg	Arg	Cys	Leu	Lys	1890	1895	1900
Pro	Val	Ile	Leu	Pro	Asp	Gly	Pro	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	1905	1910	1915
Ile	Pro	Val	Thr	Pro	Ala	Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	1925	1930	1935
Arg	Asn	Pro	Ala	Gln	Glu	Asp	Asp	Gln	Tyr	Val	Phe	Ser	Gly	Asp	Pro	1940	1945	1950
Leu	Lys	Asn	Asp	Glu	Asp	His	Ala	His	Trp	Thr	Glu	Ala	Lys	Met	Leu	1955	1960	1965
Leu	Asp	Asn	Ile	Tyr	Thr	Pro	Glu	Gly	Ile	Ile	Pro	Thr	Leu	Phe	Gly	1970	1975	1980
Pro	Glu	Arg	Glu	Lys	Thr	Gln	Ala	Ile	Asp	Gly	Glu	Phe	Arg	Leu	Arg	1985	1990	1995
Gly	Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Arg	Arg	Gly	Asp	Leu	2000		

2005					2010					2015					
Pro	Val	Trp	Leu	Ser	Tyr	Lys	Val	Ala	Ser	Ala	Gly	Ile	Ser	Tyr	Lys
2020					2025					2030					
Asp	Arg	Glu	Trp	Cys	Phe	Thr	Gly	Glu	Arg	Asn	Asn	Gln	Ile	Leu	Glu
2035					2040					2045					
Glu	Asn	Met	Glu	Val	Glu	Ile	Trp	Thr	Arg	Glu	Gly	Glu	Lys	Lys	Lys
2050					2055					2060					
Leu	Arg	Pro	Arg	Trp	Leu	Asp	Ala	Arg	Val	Tyr	Ala	Asp	Pro	Met	Ala
2065					2070					2075					
Leu	Lys	Asp	Phe	Lys	Glu	Phe	Ala	Ser	Gly	Arg	Lys	Ser	Ile	Thr	Leu
2085					2090					2095					
Asp	Ile	Leu	Thr	Glu	Ile	Ala	Ser	Leu	Pro	Thr	Tyr	Leu	Ser	Ser	Arg
2100					2105					2110					
Ala	Lys	Leu	Ala	Leu	Asp	Asn	Ile	Val	Met	Leu	His	Thr	Thr	Glu	Arg
2115					2120					2125					
Gly	Gly	Arg	Ala	Tyr	Gln	His	Ala	Leu	Asn	Glu	Leu	Pro	Glu	Ser	Leu
2130					2135					2140					
Glu	Thr	Leu	Met	Leu	Val	Ala	Leu	Leu	Gly	Ala	Met	Thr	Ala	Gly	Ile
2145					2150					2155					
Phe	Leu	Phe	Phe	Met	Gln	Gly	Lys	Gly	Ile	Gly	Lys	Leu	Ser	Met	Gly
2165					2170					2175					
Leu	Ile	Thr	Ile	Ala	Val	Ala	Ser	Gly	Leu	Leu	Trp	Val	Ala	Glu	Ile
2180					2185					2190					
Gln	Pro	Gln	Trp	Ile	Ala	Ala	Ser	Ile	Ile	Leu	Glu	Phe	Phe	Leu	Met
2195					2200					2205					
Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp	Asn
2210					2215					2220					
Gln	Leu	Ile	Tyr	Val	Ile	Leu	Thr	Ile	Leu	Thr	Ile	Ile	Gly	Leu	Ile
2225					2230					2235					
Ala	Ala	Asn	Glu	Met	Gly	Leu	Ile	Glu	Lys	Thr	Lys	Thr	Asp	Phe	Gly
2245					2250					2255					
Phe	Tyr	Gln	Val	Lys	Thr	Glu	Thr	Thr	Ile	Leu	Asp	Val	Asp	Leu	Arg
2260					2265					2270					
Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr	Ala	Val	Ala	Thr	Thr	Ile	Leu	Thr
2275					2280					2285					
Pro	Met	Leu	Arg	His	Thr	Ile	Glu	Asn	Thr	Ser	Ala	Asn	Leu	Ser	Leu
2290					2295					2300					
Ala	Ala	Ile	Ala	Asn	Gln	Ala	Ala	Val	Leu	Met	Gly	Leu	Gly	Lys	Gly
2305					2310					2315					
Trp	Pro	Leu	His	Arg	Met	Asp	Leu	Gly	Val	Pro	Leu	Leu	Ala	Met	Gly
2325					2330					2335					
Cys	Tyr	Ser	Gln	Val	Asn	Pro	Thr	Thr	Leu	Thr	Ala	Ser	Leu	Val	Met
2340					2345					2350					
Leu	Leu	Val	His	Tyr	Ala	Ile	Ile	Gly	Pro	Gly	Leu	Gln	Ala	Lys	Ala
2355					2360					2365					
Thr	Arg	Glu	Ala	Gln	Lys	Arg	Thr	Ala	Ala	Gly	Ile	Met	Lys	Asn	Pro
2370					2375					2380					
Thr	Val	Asp	Gly	Ile	Thr	Val	Ile	Asp	Leu	Glu	Pro	Ile	Ser	Tyr	Asp
2385					2390					2395					
Pro	Lys	Phe	Glu	Lys	Gln	Leu	Gly	Gln	Val	Met	Leu	Leu	Val	Leu	Cys
2405					2410					2415					
Ala	Gly	Gln	Leu	Leu	Leu	Met	Arg	Thr	Thr	Trp	Ala	Phe	Cys	Glu	Val
2420					2425					2430					
Leu	Thr	Leu	Ala	Thr	Gly	Pro	Ile	Leu	Thr	Leu	Trp	Glu	Gly	Asn	Pro
2435					2440					2445					
Gly	Arg	Phe	Trp	Asn	Thr	Thr	Ile	Ala	Val	Ser	Thr	Ala	Asn	Ile	Phe
2450					2455					2460					
Arg	Gly	Ser	Tyr	Leu	Ala	Gly	Ala	Gly	Leu	Ala	Phe	Ser	Leu	Ile	Lys
2465					2470					2475					
Asn	Ala	Gln	Thr	Pro	Arg	Arg	Gly	Thr	Gly	Thr	Thr	Gly	Glu	Thr	Leu
2485					2490					2495					



Gly	Glu	Lys	Trp	Lys	Arg	Gln	Leu	Asn	Ser	Leu	Asp	Arg	Lys	Glu	Phe	2500	2505	2510
Glu	Glu	Tyr	Lys	Arg	Ser	Gly	Ile	Leu	Glu	Val	Asp	Arg	Thr	Glu	Ala	2515	2520	2525
Lys	Ser	Ala	Leu	Lys	Asp	Gly	Ser	Lys	Ile	Lys	His	Ala	Val	Ser	Arg	2530	2535	2540
Gly	Ser	Ser	Lys	Ile	Arg	Trp	Ile	Val	Glu	Arg	Gly	Met	Val	Lys	Pro	2545	2550	2555
Lys	Gly	Lys	Val	Val	Asp	Leu	Gly	Cys	Gly	Arg	Gly	Gly	Trp	Ser	Tyr	2565	2570	2575
Tyr	Met	Ala	Thr	Leu	Lys	Asn	Val	Thr	Glu	Val	Lys	Gly	Tyr	Thr	Lys	2580	2585	2590
Gly	Gly	Pro	Gly	His	Glu	Glu	Pro	Ile	Pro	Met	Ala	Thr	Tyr	Gly	Trp	2595	2600	2605
Asn	Leu	Val	Lys	Leu	His	Ser	Gly	Val	Asp	Val	Phe	Tyr	Lys	Pro	Thr	2610	2615	2620
Glu	Gln	Val	Asp	Thr	Leu	Leu	Cys	Asp	Ile	Gly	Glu	Ser	Ser	Ser	Asn	2625	2630	2635
Pro	Thr	Ile	Glu	Glu	Gly	Arg	Thr	Leu	Arg	Val	Leu	Lys	Met	Val	Glu	2645	2650	2655
Pro	Trp	Leu	Ser	Lys	Pro	Glu	Phe	Cys	Ile	Lys	Val	Leu	Asn	Pro		2660	2665	2670
Tyr	Met	Pro	Thr	Val	Ile	Glu	Glu	Leu	Glu	Lys	Leu	Gln	Arg	Lys	His	2675	2680	2685
Gly	Gly	Asn	Leu	Val	Arg	Cys	Pro	Leu	Ser	Arg	Asn	Ser	Thr	His	Glu	2690	2695	2700
Met	Tyr	Trp	Val	Ser	Gly	Ala	Ser	Gly	Asn	Ile	Val	Ser	Ser	Val	Asn	2705	2710	2715
Thr	Thr	Ser	Lys	Met	Leu	Leu	Asn	Arg	Phe	Thr	Thr	Arg	His	Arg	Lys	2725	2730	2735
Pro	Thr	Tyr	Glu	Lys	Asp	Val	Asp	Leu	Gly	Ala	Gly	Thr	Arg	Ser	Val	2740	2745	2750
Ser	Thr	Glu	Thr	Glu	Lys	Pro	Asp	Met	Thr	Ile	Ile	Gly	Arg	Arg	Leu	2755	2760	2765
Gln	Arg	Leu	Gln	Glu	Glu	His	Lys	Glu	Thr	Trp	His	Tyr	Asp	Gln	Glu	2770	2775	2780
Asn	Pro	Tyr	Arg	Thr	Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Ala	Pro	Ser	2785	2790	2795
Thr	Gly	Ser	Ala	Ser	Ser	Met	Val	Asn	Gly	Val	Val	Lys	Leu	Leu	Thr	2805	2810	2815
Lys	Pro	Trp	Asp	Val	Ile	Pro	Met	Val	Thr	Gln	Leu	Ala	Met	Thr	Asp	2820	2825	2830
Thr	Thr	Pro	Phe	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu	Lys	Val	Asp	Thr	2835	2840	2845
Arg	Thr	Pro	Gln	Pro	Lys	Pro	Gly	Thr	Arg	Met	Val	Met	Thr	Thr	Thr	2850	2855	2860
Ala	Asn	Trp	Leu	Trp	Ala	Leu	Leu	Gly	Lys	Lys	Lys	Asn	Pro	Arg	Leu	2865	2870	2875
Cys	Thr	Arg	Glu	Glu	Phe	Ile	Ser	Lys	Val	Arg	Ser	Asn	Ala	Ala	Ile	2885	2890	2895
Gly	Ala	Val	Phe	Gln	Glu	Glu	Gln	Gly	Trp	Thr	Ser	Ala	Ser	Glu	Ala	2900	2905	2910
Val	Asn	Asp	Ser	Arg	Phe	Trp	Glu	Leu	Val	Asp	Lys	Glu	Arg	Ala	Leu	2915	2920	2925
His	Gln	Glu	Gly	Lys	Cys	Glu	Ser	Cys	Val	Tyr	Asn	Met	Met	Gly	Lys	2930	2935	2940
Arg	Glu	Lys	Lys	Leu	Gly	Glu	Phe	Gly	Arg	Ala	Lys	Gly	Ser	Arg	Ala	2945	2950	2955
Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg	Phe	Leu	Glu	Phe	Glu	Ala	Leu	2965	2970	2975
Gly	Phe	Leu	Asn	Glu	Asp	His	Trp	Phe	Gly	Arg	Glu	Asn	Ser	Trp	Ser			

2980					2985					2990					
Gly	Val	Glu	Gly	Glu	Gly	Leu	His	Arg	Leu	Gly	Tyr	Ile	Leu	Glu	Glu
2995					3000					3005					
Ile	Asp	Lys	Lys	Asp	Gly	Asp	Leu	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly
3010					3015					3020					
Trp	Asp	Thr	Arg	Ile	Thr	Glu	Asp	Asp	Leu	Gln	Asn	Glu	Glu	Leu	Ile
3025					3030					3035					
Thr	Glu	Gln	Met	Ala	Pro	His	His	Lys	Ile	Leu	Ala	Lys	Ala	Ile	Phe
3045					3050					3055					
Lys	Leu	Thr	Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Thr	Pro
3060					3065					3070					
Arg	Gly	Ala	Val	Met	Asp	Ile	Ile	Ser	Arg	Lys	Asp	Gln	Arg	Gly	Ser
3075					3080					3085					
Gly	Gln	Val	Gly	Thr	Tyr	Gly	Leu	Asn	Thr	Phe	Thr	Asn	Met	Glu	Val
3090					3095					3100					
Gln	Leu	Ile	Arg	Gln	Met	Glu	Ala	Glu	Gly	Val	Ile	Thr	Gln	Asp	Asp
3105					3110					3115					
Met	Gln	Asn	Pro	Lys	Gly	Leu	Lys	Glu	Arg	Val	Glu	Lys	Trp	Leu	Lys
3125					3130					3135					
Glu	Cys	Gly	Val	Asp	Arg	Leu	Lys	Arg	Met	Ala	Ile	Ser	Gly	Asp	Asp
3140					3145					3150					
Cys	Val	Val	Lys	Pro	Leu	Asp	Glu	Arg	Phe	Gly	Thr	Ser	Leu	Leu	Phe
3155					3160					3165					
Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Ile	Pro	Gln	Trp	Glu	Pro
3170					3175					3180					
Ser	Lys	Gly	Trp	Lys	Asn	Trp	Gln	Glu	Val	Pro	Phe	Cys	Ser	His	His
3185					3190					3195					
Phe	His	Lys	Ile	Phe	Met	Lys	Asp	Gly	Arg	Ser	Leu	Val	Val	Pro	Cys
3205					3210					3215					
Arg	Asn	Gln	Asp	Glu	Leu	Ile	Gly	Arg	Ala	Arg	Ile	Ser	Gln	Gly	Ala
3220					3225					3230					
Gly	Trp	Ser	Leu	Arg	Glu	Thr	Ala	Cys	Leu	Gly	Lys	Ala	Tyr	Ala	Gln
3235					3240					3245					
Met	Trp	Ser	Leu	Met	Tyr	Phe	His	Arg	Arg	Asp	Leu	Arg	Leu	Ala	Ser
3250					3255					3260					
Met	Ala	Ile	Cys	Ser	Ala	Val	Pro	Thr	Glu	Trp	Phe	Pro	Thr	Ser	Arg
3265					3270					3275					
Thr	Thr	Trp	Ser	Ile	His	Ala	His	His	Gln	Trp	Met	Thr	Thr	Glu	Asp
3285					3290					3295					
Met	Leu	Lys	Val	Trp	Asn	Arg	Val	Trp	Ile	Glu	Asp	Asn	Pro	Asn	Met
3300					3305					3310					
Thr	Asp	Lys	Thr	Pro	Val	His	Ser	Trp	Glu	Asp	Ile	Pro	Tyr	Leu	Gly
3315					3320					3325					
Lys	Arg	Glu	Asp	Leu	Trp	Cys	Gly	Ser	Leu	Ile	Gly	Leu	Ser	Ser	Arg
3330					3335					3340					
Ala	Thr	Trp	Ala	Lys	Asn	Ile	His	Thr	Ala	Ile	Thr	Gln	Val	Arg	Asn
3345					3350					3355					
Leu	Ile	Gly	Lys	Glu	Glu	Tyr	Val	Asp	Tyr	Met	Pro	Val	Met	Lys	Arg
3365					3370					3375					
Tyr	Ser	Ala	Pro	Ser	Glu	Ser	Glu	Gly	Val	Leu					
3380					3385										

<210> 20

<211> 3392

<212> PRT

<213> Dengue 1 virus strain WP

<400> 20

Met	Asn	Asn	Gln	Arg	Lys	Lys	Thr	Gly	Arg	Pro	Ser	Phe	Asn	Met	Leu
1					5				10					15	

Lys	Arg	Ala	Arg	Asn	Arg	Val	Ser	Thr	Val	Ser	Gln	Leu	Ala	Lys	Arg
			20					25					30		
Phe	Ser	Lys	Gly	Leu	Leu	Ser	Gly	Gln	Gly	Pro	Met	Lys	Leu	Val	Met
		35					40					45			
Ala	Phe	Ile	Ala	Phe	Leu	Arg	Phe	Leu	Ala	Ile	Pro	Pro	Thr	Ala	Gly
		50				55					60				
Ile	Leu	Ala	Arg	Trp	Gly	Ser	Phe	Lys	Lys	Asn	Gly	Ala	Ile	Lys	Val
65					70					75					80
Leu	Arg	Gly	Phe	Lys	Lys	Glu	Ile	Ser	Asn	Met	Leu	Asn	Ile	Met	Asn
				85					90					95	
Arg	Arg	Lys	Arg	Ser	Val	Thr	Met	Leu	Leu	Met	Leu	Leu	Pro	Thr	Ala
			100					105					110		
Leu	Ala	Phe	His	Leu	Thr	Thr	Arg	Gly	Gly	Glu	Pro	His	Met	Ile	Val
		115					120					125			
Ser	Lys	Gln	Glu	Arg	Gly	Lys	Ser	Leu	Leu	Phe	Lys	Thr	Ser	Ala	Gly
		130				135					140				
Val	Asn	Met	Cys	Thr	Leu	Ile	Ala	Met	Asp	Leu	Gly	Glu	Leu	Cys	Glu
145					150				155						160
Asp	Thr	Met	Thr	Tyr	Lys	Cys	Pro	Arg	Ile	Thr	Glu	Thr	Glu	Pro	Asp
				165					170					175	
Asp	Val	Asp	Cys	Trp	Cys	Asn	Ala	Thr	Glu	Thr	Trp	Val	Thr	Tyr	Gly
			180					185					190		
Thr	Cys	Ser	Gln	Thr	Gly	Glu	His	Arg	Arg	Asp	Lys	Arg	Ser	Val	Ala
		195					200					205			
Leu	Ala	Pro	His	Val	Gly	Leu	Gly	Leu	Glu	Thr	Arg	Thr	Glu	Thr	Trp
		210				215					220				
Met	Ser	Ser	Glu	Gly	Ala	Trp	Lys	Gln	Ile	Gln	Lys	Val	Glu	Thr	Trp
225					230					235					240
Ala	Leu	Arg	His	Pro	Gly	Phe	Thr	Val	Ile	Ala	Leu	Phe	Leu	Ala	His
				245					250					255	
Ala	Ile	Gly	Thr	Ser	Ile	Thr	Gln	Lys	Gly	Ile	Ile	Phe	Ile	Leu	Leu
			260					265					270		
Met	Leu	Val	Thr	Pro	Ser	Met	Ala	Met	Arg	Cys	Val	Gly	Ile	Gly	Asn
		275					280					285			
Arg	Asp	Phe	Val	Glu	Gly	Leu	Ser	Gly	Ala	Thr	Trp	Val	Asp	Val	Val
		290				295					300				
Leu	Glu	His	Gly	Ser	Cys	Val	Thr	Thr	Met	Ala	Lys	Asp	Lys	Pro	Thr
305					310					315					320
Leu	Asp	Ile	Glu	Leu	Leu	Lys	Thr	Glu	Val	Thr	Asn	Pro	Ala	Val	Leu
				325					330					335	
Arg	Lys	Leu	Cys	Ile	Glu	Ala	Lys	Ile	Ser	Asn	Thr	Thr	Thr	Asp	Ser
			340					345					350		
Arg	Cys	Pro	Thr	Gln	Gly	Glu	Ala	Thr	Leu	Val	Glu	Glu	Gln	Asp	Thr
		355					360					365			
Asn	Phe	Val	Cys	Arg	Arg	Thr	Phe	Val	Asp	Arg	Gly	Trp	Gly	Asn	Gly
		370				375					380				
Cys	Gly	Leu	Phe	Gly	Lys	Gly	Ser	Leu	Ile	Thr	Cys	Ala	Lys	Phe	Lys
385					390					395					400
Cys	Val	Thr	Lys	Leu	Glu	Gly	Lys	Ile	Val	Gln	Tyr	Glu	Asn	Leu	Lys
				405					410					415	
Tyr	Ser	Val	Ile	Val	Thr	Val	His	Thr	Gly	Asp	Gln	His	Gln	Val	Gly
			420					425					430		
Asn	Glu	Thr	Thr	Glu	His	Gly	Thr	Thr	Ala	Thr	Ile	Thr	Pro	Gln	Ala
		435					440					445			
Pro	Thr	Ser	Glu	Ile	Gln	Leu	Thr	Asp	Tyr	Gly	Ala	Leu	Thr	Leu	Asp
		450				455					460				
Cys	Ser	Pro	Arg	Thr	Gly	Leu	Asp	Phe	Asn	Glu	Met	Val	Leu	Leu	Thr
465					470					475					480
Met	Glu	Lys	Lys	Ser	Trp	Leu	Val	His	Lys	Gln	Trp	Phe	Leu	Asp	Leu
				485					490					495	
Pro	Leu	Pro	Trp	Thr	Ser	Gly	Ala	Ser	Thr	Ser	Gln	Glu	Thr	Trp	Asn

			500					505					510			
Arg	Gln	Asp	Leu	Leu	Val	Thr	Phe	Lys	Thr	Ala	His	Ala	Lys	Lys	Gln	
		515					520					525				
Glu	Val	Val	Val	Leu	Gly	Ser	Gln	Glu	Gly	Ala	Met	His	Thr	Ala	Leu	
		530					535					540				
Thr	Gly	Ala	Thr	Glu	Ile	Gln	Thr	Ser	Gly	Thr	Thr	Thr	Ile	Phe	Ala	
545					550					555					560	
Gly	His	Leu	Lys	Cys	Arg	Leu	Lys	Met	Asp	Lys	Leu	Thr	Leu	Lys	Gly	
				565					570					575		
Met	Ser	Tyr	Val	Met	Cys	Thr	Gly	Ser	Phe	Lys	Leu	Glu	Lys	Glu	Val	
			580					585					590			
Ala	Glu	Thr	Gln	His	Gly	Thr	Val	Leu	Val	Gln	Val	Lys	Tyr	Glu	Gly	
		595					600					605				
Thr	Asp	Ala	Pro	Cys	Lys	Ile	Pro	Phe	Ser	Ser	Gln	Asp	Glu	Lys	Gly	
	610					615					620					
Val	Thr	Gln	Asn	Gly	Arg	Leu	Ile	Thr	Ala	Asn	Pro	Ile	Val	Thr	Asp	
625				630						635					640	
Lys	Glu	Lys	Pro	Val	Asn	Ile	Glu	Ala	Glu	Pro	Pro	Phe	Gly	Glu	Ser	
				645					650					655		
Tyr	Ile	Val	Val	Gly	Ala	Gly	Glu	Lys	Ala	Leu	Lys	Leu	Ser	Trp	Phe	
			660					665					670			
Lys	Lys	Gly	Ser	Ser	Ile	Gly	Lys	Met	Phe	Glu	Ala	Thr	Ala	Arg	Gly	
		675					680					685				
Ala	Arg	Arg	Met	Ala	Ile	Leu	Gly	Asp	Thr	Ala	Trp	Asp	Phe	Gly	Ser	
	690				695						700					
Ile	Gly	Gly	Val	Phe	Thr	Ser	Val	Gly	Lys	Leu	Ile	His	Gln	Ile	Phe	
705					710					715					720	
Gly	Thr	Ala	Tyr	Gly	Val	Leu	Phe	Ser	Gly	Val	Ser	Trp	Thr	Met	Lys	
				725					730					735		
Ile	Gly	Ile	Gly	Ile	Leu	Leu	Thr	Trp	Leu	Gly	Leu	Asn	Ser	Arg	Ser	
			740					745					750			
Thr	Ser	Leu	Ser	Met	Thr	Cys	Ile	Ala	Val	Gly	Met	Val	Thr	Leu	Tyr	
		755					760					765				
Leu	Gly	Val	Met	Val	Gln	Ala	Asp	Ser	Gly	Cys	Val	Ile	Asn	Trp	Lys	
	770					775					780					
Gly	Arg	Glu	Leu	Lys	Cys	Gly	Ser	Gly	Ile	Phe	Val	Thr	Asn	Glu	Val	
785					790					795					800	
His	Thr	Trp	Thr	Glu	Gln	Tyr	Lys	Phe	Gln	Ala	Asp	Ser	Pro	Lys	Arg	
				805					810					815		
Leu	Ser	Ala	Ala	Ile	Gly	Lys	Ala	Trp	Glu	Glu	Gly	Val	Cys	Gly	Ile	
			820					825					830			
Arg	Ser	Ala	Thr	Arg	Leu	Glu	Asn	Ile	Met	Trp	Lys	Gln	Ile	Ser	Asn	
		835					840					845				
Glu	Leu	Asn	His	Ile	Leu	Leu	Glu	Asn	Asp	Met	Lys	Phe	Thr	Val	Val	
	850					855					860					
Val	Gly	Asp	Val	Ser	Gly	Ile	Leu	Ala	Gln	Gly	Lys	Lys	Met	Ile	Arg	
865					870					875					880	
Pro	Gln	Pro	Met	Glu	His	Lys	Tyr	Ser	Trp	Lys	Ser	Trp	Gly	Lys	Ala	
				885					890					895		
Lys	Ile	Ile	Gly	Ala	Asp	Val	Gln	Asn	Thr	Thr	Phe	Ile	Ile	Asp	Gly	
			900					905					910			
Pro	Asn	Thr	Pro	Glu	Cys	Pro	Asp	Asn	Gln	Arg	Ala	Trp	Asn	Ile	Trp	
		915					920					925				
Glu	Val	Glu	Asp	Tyr	Gly	Phe	Gly	Ile	Phe	Thr	Thr	Asn	Ile	Trp	Leu	
	930					935					940					
Lys	Leu	Arg	Asp	Ser	Tyr	Thr	Gln	Val	Cys	Asp	His	Arg	Leu	Met	Ser	
945					950					955					960	
Ala	Ala	Ile	Lys	Asp	Ser	Lys	Ala	Val	His	Ala	Asp	Met	Gly	Tyr	Trp	
				965					970					975		
Ile	Glu	Ser	Glu	Lys	Asn	Glu	Thr	Trp	Lys	Leu	Ala	Arg	Ala	Ser	Phe	
			980					985					990			

Ile	Glu	Val	Lys	Thr	Cys	Ile	Trp	Pro	Lys	Ser	His	Thr	Leu	Trp	Ser
		995					1000					1005			
Asn	Gly	Val	Leu	Glu	Ser	Glu	Met	Ile	Ile	Pro	Lys	Ile	Tyr	Gly	Gly
		1010					1015				1020				
Pro	Ile	Ser	Gln	His	Asn	Tyr	Arg	Pro	Gly	Tyr	Phe	Thr	Gln	Thr	Ala
1025					1030					1035					1040
Gly	Pro	Trp	His	Leu	Gly	Lys	Leu	Glu	Leu	Asp	Phe	Asp	Leu	Cys	Glu
				1045					1050					1055	
Gly	Thr	Thr	Val	Val	Val	Asp	Glu	His	Cys	Gly	Asn	Arg	Gly	Pro	Ser
			1060					1065					1070		
Leu	Arg	Thr	Thr	Thr	Val	Thr	Gly	Lys	Thr	Ile	His	Glu	Trp	Cys	Cys
			1075				1080					1085			
Arg	Ser	Cys	Thr	Leu	Pro	Pro	Leu	Arg	Phe	Lys	Gly	Glu	Asp	Gly	Cys
	1090					1095					1100				
Trp	Tyr	Gly	Met	Glu	Ile	Arg	Pro	Val	Lys	Glu	Lys	Glu	Glu	Asn	Leu
1105					1110					1115					1120
Val	Lys	Ser	Met	Val	Ser	Ala	Gly	Ser	Gly	Glu	Val	Asp	Ser	Phe	Ser
				1125					1130					1135	
Leu	Gly	Leu	Leu	Cys	Ile	Ser	Ile	Met	Ile	Glu	Glu	Val	Met	Arg	Ser
			1140					1145					1150		
Arg	Trp	Ser	Arg	Lys	Met	Leu	Met	Thr	Gly	Thr	Leu	Ala	Val	Phe	Leu
		1155				1160					1165				
Leu	Leu	Thr	Met	Gly	Gln	Leu	Thr	Trp	Asn	Asp	Leu	Ile	Arg	Leu	Cys
	1170					1175				1180					
Ile	Met	Val	Gly	Ala	Asn	Ala	Ser	Asp	Lys	Met	Gly	Met	Gly	Thr	Thr
1185					1190					1195					1200
Tyr	Leu	Ala	Leu	Met	Ala	Thr	Phe	Arg	Met	Arg	Pro	Met	Phe	Ala	Val
				1205					1210					1215	
Gly	Leu	Leu	Phe	Arg	Arg	Leu	Thr	Ser	Arg	Glu	Val	Leu	Leu	Leu	Thr
			1220					1225					1230		
Val	Gly	Leu	Ser	Leu	Val	Ala	Ser	Val	Glu	Leu	Pro	Asn	Ser	Leu	Glu
		1235					1240				1245				
Glu	Leu	Gly	Asp	Gly	Leu	Ala	Met	Gly	Ile	Met	Met	Leu	Lys	Leu	Leu
		1250				1255				1260					
Thr	Asp	Phe	Gln	Ser	His	Gln	Leu	Trp	Ala	Thr	Leu	Leu	Ser	Leu	Thr
1265					1270					1275					1280
Phe	Val	Lys	Thr	Thr	Phe	Ser	Leu	His	Tyr	Ala	Trp	Lys	Thr	Met	Ala
				1285					1290					1295	
Met	Ile	Leu	Ser	Ile	Val	Ser	Leu	Phe	Pro	Leu	Cys	Leu	Ser	Thr	Thr
			1300					1305					1310		
Ser	Gln	Lys	Thr	Thr	Trp	Leu	Pro	Val	Leu	Leu	Gly	Ser	Leu	Gly	Cys
		1315				1320					1325				
Lys	Pro	Leu	Thr	Met	Phe	Leu	Ile	Thr	Glu	Asn	Lys	Ile	Trp	Gly	Arg
	1330					1335</									

1475					1480					1485						
Glu	Arg	Ala	Val	Leu	Asp	Asp	Gly	Ile	Tyr	Arg	Ile	Leu	Gln	Arg	Gly	
1490					1495					1500						
Leu	Leu	Gly	Arg	Ser	Gln	Val	Gly	Val	Gly	Val	Phe	Gln	Glu	Gly	Val	
1505					1510					1515					1520	
Phe	His	Thr	Met	Trp	His	Val	Thr	Arg	Gly	Ala	Val	Leu	Met	Tyr	Gln	
1525					1530					1535						
Gly	Lys	Arg	Leu	Glu	Pro	Ser	Trp	Ala	Ser	Val	Lys	Lys	Asp	Leu	Ile	
1540					1545					1550						
Ser	Tyr	Gly	Gly	Gly	Trp	Arg	Phe	Gln	Gly	Ser	Trp	Asn	Ala	Gly	Glu	
1555					1560					1565						
Glu	Val	Gln	Val	Ile	Ala	Val	Glu	Pro	Gly	Lys	Asn	Pro	Lys	Asn	Val	
1570					1575					1580						
Gln	Thr	Ala	Pro	Gly	Thr	Phe	Lys	Thr	Pro	Glu	Gly	Glu	Val	Gly	Ala	
1585					1590					1595					1600	
Ile	Ala	Leu	Asp	Phe	Lys	Pro	Gly	Thr	Ser	Gly	Ser	Pro	Ile	Val	Asn	
1605					1610					1615						
Arg	Glu	Gly	Lys	Ile	Val	Gly	Leu	Tyr	Gly	Asn	Gly	Val	Val	Thr	Thr	
1620					1625					1630						
Ser	Gly	Thr	Tyr	Val	Ser	Ala	Ile	Ala	Gln	Ala	Lys	Ala	Ser	Gln	Glu	
1635					1640					1645						
Gly	Pro	Leu	Pro	Glu	Ile	Glu	Asp	Glu	Val	Phe	Arg	Lys	Arg	Asn	Leu	
1650					1655					1660						
Thr	Ile	Met	Asp	Leu	His	Pro	Gly	Ser	Gly	Lys	Thr	Arg	Arg	Tyr	Leu	
1665					1670					1675					1680	
Pro	Ala	Ile	Val	Arg	Glu	Ala	Ile	Arg	Arg	Asn	Val	Arg	Thr	Leu	Val	
1685					1690					1695						
Leu	Ala	Pro	Thr	Arg	Val	Val	Ala	Ser	Glu	Met	Ala	Glu	Ala	Leu	Lys	
1700					1705					1710						
Gly	Met	Pro	Ile	Arg	Tyr	Gln	Thr	Thr	Ala	Val	Lys	Ser	Glu	His	Thr	
1715					1720					1725						
Gly	Lys	Glu	Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Met	Arg	
1730					1735					1740						
Leu	Leu	Ser	Pro	Val	Arg	Val	Pro	Asn	Tyr	Asn	Met	Ile	Ile	Met	Asp	
1745					1750					1755					1760	
Glu	Ala	His	Phe	Thr	Asp	Pro	Ala	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile	
1765					1770					1775						
Ser	Thr	Arg	Val	Gly	Met	Gly	Glu	Ala	Ala	Ile	Phe	Met	Thr	Ala		
1780					1785					1790						
Thr	Pro	Pro	Gly	Ser	Val	Glu	Ala	Phe	Pro	Gln	Ser	Asn	Ala	Val	Ile	
1795					1800					1805						
Gln	Asp	Glu	Glu	Arg	Asp	Ile	Pro	Glu	Arg	Ser	Trp	Asn	Ser	Gly	Tyr	
1810					1815					1820						
Asp	Trp	Ile	Thr	Asp	Phe	Pro	Gly	Lys	Thr	Val	Trp	Phe	Val	Pro	Ser	
1825					1830					1835					1840	
Ile	Lys	Ser	Gly	Asn	Asp	Ile	Ala	Asn	Cys	Leu	Arg	Lys	Asn	Gly	Lys	
1845					1850					1855						
Arg	Val	Val	Gln	Leu	Ser	Arg	Lys	Thr	Phe	Asp	Thr	Glu	Tyr	Gln	Lys	
1860					1865					1870						
Thr	Lys	Asn	Asn	Asp	Trp	Asp	Tyr	Val	Val	Thr	Thr	Asp	Ile	Ser	Glu	
1875					1880					1885						
Met	Gly	Ala	Asn	Phe	Arg	Ala	Asp	Arg	Val	Ile	Asp	Pro	Arg	Arg	Cys	
1890					1895					1900						
Leu	Lys	Pro	Val	Ile	Leu	Lys	Asp	Gly	Pro	Glu	Arg	Val	Ile	Leu	Ala	
1905					1910					1915					1920	
Gly	Pro	Met	Pro	Val	Thr	Val	Ala	Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	
1925					1930					1935						
Ile	Gly	Arg	Asn	Gln	Asn	Lys	Glu	Gly	Asp	Gln	Tyr	Ile	Tyr	Met	Gly	
1940					1945					1950						
Gln	Pro	Leu	Asn	Asn	Asp	Glu	Asp	His	Ala	His	Trp	Thr	Glu	Ala	Lys	
1955					1960					1965						

Met Leu Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ala Leu  
 1970 1975 1980  
 Phe Glu Pro Glu Arg Glu Lys Ser Ala Ala Ile Asp Gly Glu Tyr Arg  
 1985 1990 1995 2000  
 Leu Arg Gly Glu Ala Arg Lys Thr Phe Val Glu Leu Met Arg Arg Gly  
 2005 2010 2015  
 Asp Leu Pro Val Trp Leu Ser Tyr Lys Val Ala Ser Glu Gly Phe Gln  
 2020 2025 2030  
 Tyr Ser Asp Arg Arg Trp Cys Phe Asp Gly Glu Arg Asn Asn Gln Val  
 2035 2040 2045  
 Leu Glu Glu Asn Met Asp Val Glu Ile Trp Thr Lys Glu Gly Glu Arg  
 2050 2055 2060  
 Lys Lys Leu Arg Pro Arg Trp Leu Asp Ala Arg Thr Tyr Ser Asp Pro  
 2065 2070 2075 2080  
 Leu Ala Leu Arg Glu Phe Lys Glu Phe Ala Ala Gly Arg Arg Ser Val  
 2085 2090 2095  
 Ser Gly Asp Leu Ile Leu Glu Ile Gly Lys Leu Pro Gln His Leu Thr  
 2100 2105 2110  
 Gln Arg Ala Gln Asn Ala Leu Asp Asn Leu Val Met Leu His Asn Ser  
 2115 2120 2125  
 Glu Gln Gly Gly Lys Ala Tyr Arg His Ala Met Glu Glu Leu Pro Asp  
 2130 2135 2140  
 Thr Ile Glu Thr Leu Met Leu Leu Ala Leu Ile Ala Val Leu Thr Gly  
 2145 2150 2155 2160  
 Gly Val Thr Leu Phe Phe Leu Ser Gly Arg Gly Leu Gly Lys Thr Ser  
 2165 2170 2175  
 Ile Gly Leu Leu Cys Val Ile Ala Ser Ser Ala Leu Leu Trp Met Ala  
 2180 2185 2190  
 Ser Val Glu Pro His Trp Ile Ala Ser Ile Ile Leu Glu Phe Phe  
 2195 2200 2205  
 Leu Met Val Leu Leu Ile Pro Glu Pro Asp Arg Gln Arg Thr Pro Gln  
 2210 2215 2220  
 Asp Asn Gln Leu Ala Tyr Val Val Ile Gly Leu Leu Phe Met Ile Leu  
 2225 2230 2235 2240  
 Thr Ala Ala Ala Asn Glu Met Gly Leu Leu Glu Thr Thr Lys Lys Asp  
 2245 2250 2255  
 Leu Gly Ile Gly His Ala Ala Ala Glu Asn His His His Ala Ala Met  
 2260 2265 2270  
 Leu Asp Val Asp Leu His Pro Ala Ser Ala Trp Thr Leu Tyr Ala Val  
 2275 2280 2285  
 Ala Thr Thr Ile Ile Thr Pro Met Met Arg His Thr Ile Glu Asn Thr  
 2290 2295 2300  
 Thr Ala Asn Ile Ser Leu Thr Ala Ile Ala Asn Gln Ala Ala Ile Leu  
 2305 2310 2315 2320  
 Met Gly Leu Asp Lys Gly Trp Pro Ile Ser Lys Met Asp Ile Gly Val  
 2325 2330 2335  
 Pro Leu Leu Ala Leu Gly Cys Tyr Ser Gln Val Asn Pro Leu Thr Leu  
 2340 2345 2350  
 Thr Ala Ala Val Phe Met Leu Val Ala His Tyr Ala Ile Ile Gly Pro  
 2355 2360 2365  
 Gly Leu Gln Ala Lys Ala Thr Arg Glu Ala Gln Lys Arg Thr Ala Ala  
 2370 2375 2380  
 Gly Ile Met Lys Asn Pro Thr Val Asp Gly Ile Val Ala Ile Asp Leu  
 2385 2390 2395 2400  
 Asp Pro Val Val Tyr Asp Ala Lys Phe Glu Lys Gln Leu Gly Gln Ile  
 2405 2410 2415  
 Met Leu Leu Ile Leu Cys Thr Ser Gln Ile Leu Leu Met Arg Thr Thr  
 2420 2425 2430  
 Trp Ala Leu Cys Glu Ser Ile Thr Leu Ala Thr Gly Pro Leu Thr Thr  
 2435 2440 2445  
 Leu Trp Glu Gly Ser Pro Gly Lys Phe Trp Asn Thr Thr Ile Ala Val

2450	2455	2460
Ser Met Ala Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Gly Leu		
2465	2470	2475
Ala Phe Ser Leu Met Lys Ser Leu Gly Gly Arg Arg Gly Thr Gly		
	2485	2490
Ala Gln Gly Glu Thr Leu Gly Glu Lys Trp Lys Arg Gln Leu Asn Gln		
	2500	2505
Leu Ser Lys Ser Glu Phe Asn Thr Tyr Lys Arg Ser Gly Ile Ile Glu		
	2515	2520
Val Asp Arg Ser Glu Ala Lys Glu Gly Leu Lys Arg Gly Glu Pro Thr		
	2530	2535
Lys His Ala Val Ser Arg Gly Thr Ala Lys Leu Arg Trp Phe Val Glu		
2545	2550	2555
Arg Asn Leu Val Lys Pro Glu Gly Lys Val Ile Asp Leu Gly Cys Gly		
	2565	2570
Arg Gly Gly Trp Ser Tyr Tyr Cys Ala Gly Leu Lys Lys Val Thr Glu		
	2580	2585
Val Lys Gly Tyr Thr Lys Gly Gly Pro Gly His Glu Glu Pro Ile Pro		
	2595	2600
Met Ala Thr Tyr Gly Trp Asn Leu Val Lys Leu Tyr Ser Gly Lys Asp		
	2610	2615
Val Phe Phe Thr Pro Pro Glu Lys Cys Asp Thr Leu Leu Cys Asp Ile		
2625	2630	2635
Gly Glu Ser Ser Pro Asn Pro Thr Ile Glu Glu Gly Arg Thr Leu Arg		
	2645	2650
Val Leu Lys Met Val Glu Pro Trp Leu Arg Gly Asn Gln Phe Cys Ile		
	2660	2665
Lys Ile Leu Asn Pro Tyr Met Pro Ser Val Val Glu Thr Leu Glu Gln		
	2675	2680
Met Gln Arg Lys His Gly Gly Met Leu Val Arg Asn Pro Leu Ser Arg		
	2690	2695
Asn Ser Thr His Glu Met Tyr Trp Val Ser Cys Gly Thr Gly Asn Ile		
2705	2710	2715
Val Ser Ala Val Asn Met Thr Ser Arg Met Leu Leu Asn Arg Phe Thr		
	2725	2730
Met Ala His Arg Lys Pro Thr Tyr Glu Arg Asp Val Asp Leu Gly Ala		
	2740	2745
Gly Thr Arg His Val Ala Val Glu Pro Glu Val Ala Asn Leu Asp Ile		
	2755	2760
Ile Gly Gln Arg Ile Glu Asn Ile Lys Asn Gly His Lys Ser Thr Trp		
	2770	2775
His Tyr Asp Glu Asp Asn Pro Tyr Lys Thr Trp Ala Tyr His Gly Ser		
2785	2790	2795
Tyr Glu Val Lys Pro Ser Gly Ser Ala Ser Ser Met Val Asn Gly Val		
	2805	2810
Val Arg Leu Leu Thr Lys Pro Trp Asp Val Ile Pro Met Val Thr Gln		
	2820	2825
Ile Ala Met Thr Asp Thr Thr Pro Phe Gly Gln Gln Arg Val Phe Lys		
	2835	2840
Glu Lys Val Asp Thr Arg Thr Pro Lys Ala Lys Arg Gly Thr Ala Gln		
	2850	2855
Ile Met Glu Val Thr Ala Arg Trp Leu Trp Gly Phe Leu Ser Arg Asn		
2865	2870	2875
Lys Lys Pro Arg Ile Cys Thr Arg Glu Glu Phe Thr Arg Lys Val Arg		
	2885	2890
Ser Asn Ala Ala Ile Gly Ala Val Phe Val Asp Glu Asn Gln Trp Asn		
	2900	2905
Ser Ala Lys Glu Ala Val Glu Asp Glu Arg Phe Trp Asp Leu Val His		
	2915	2920
Arg Glu Arg Glu Leu His Lys Gln Gly Lys Cys Ala Thr Cys Val Tyr		
2930	2935	2940



Asn Met Met Gly Lys Arg Glu Lys Lys Leu Gly Glu Phe Gly Lys Ala  
 2945 2950 2955 2960  
 Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu  
 2965 2970 2975  
 Glu Phe Glu Ala Leu Gly Phe Met Asn Glu Asp His Trp Phe Ser Arg  
 2980 2985 2990  
 Glu Asn Ser Leu Ser Gly Val Glu Gly Glu Gly Leu His Lys Leu Gly  
 2995 3000 3005  
 Tyr Ile Leu Arg Asp Ile Ser Lys Ile Pro Gly Gly Asn Met Tyr Ala  
 3010 3015 3020  
 Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile Thr Glu Asp Asp Leu Gln  
 3025 3030 3035 3040  
 Asn Glu Ala Lys Ile Thr Asp Ile Met Glu Pro Glu His Ala Leu Leu  
 3045 3050 3055  
 Ala Thr Ser Ile Phe Lys Leu Thr Tyr Gln Asn Lys Val Val Arg Val  
 3060 3065 3070  
 Gln Arg Pro Ala Lys Asn Gly Thr Val Met Asp Val Ile Ser Arg Arg  
 3075 3080 3085  
 Asp Gln Arg Gly Ser Gly Gln Val Gly Thr Tyr Gly Leu Asn Thr Phe  
 3090 3095 3100  
 Thr Asn Met Glu Ala Gln Leu Ile Arg Gln Met Glu Ser Glu Gly Ile  
 3105 3110 3115 3120  
 Phe Ser Pro Ser Glu Leu Glu Thr Pro Asn Leu Ala Glu Arg Val Leu  
 3125 3130 3135  
 Asp Trp Leu Lys Lys His Gly Thr Glu Arg Leu Lys Arg Met Ala Ile  
 3140 3145 3150  
 Ser Gly Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala Thr  
 3155 3160 3165  
 Ala Leu Thr Ala Leu Asn Asp Met Gly Lys Val Arg Lys Asp Ile Pro  
 3170 3175 3180  
 Gln Trp Glu Pro Ser Lys Gly Trp Asn Asp Trp Gln Gln Val Pro Phe  
 3185 3190 3195 3200  
 Cys Ser His His Phe His Gln Leu Ile Met Lys Asp Gly Arg Glu Ile  
 3205 3210 3215  
 Val Val Pro Cys Arg Asn Gln Asp Glu Leu Val Gly Arg Ala Arg Val  
 3220 3225 3230  
 Ser Gln Gly Ala Gly Trp Ser Leu Arg Glu Thr Ala Cys Leu Gly Lys  
 3235 3240 3245  
 Ser Tyr Ala Gln Met Trp Gln Leu Met Tyr Phe His Arg Arg Asp Leu  
 3250 3255 3260  
 Arg Leu Ala Ala Asn Ala Ile Cys Ser Ala Val Pro Val Asp Trp Val  
 3265 3270 3275 3280  
 Pro Thr Ser Arg Thr Thr Trp Ser Ile His Ala His His Gln Trp Met  
 3285 3290 3295  
 Thr Thr Glu Asp Met Leu Ser Val Trp Asn Arg Val Trp Ile Glu Glu  
 3300 3305 3310  
 Asn Pro Trp Met Glu Asp Lys Thr His Val Ser Ser Trp Glu Asp Val  
 3315 3320 3325  
 Pro Tyr Leu Gly Lys Arg Glu Asp Arg Trp Cys Gly Ser Leu Ile Gly  
 3330 3335 3340  
 Leu Thr Ala Arg Ala Thr Trp Ala Thr Asn Ile Gln Val Ala Ile Asn  
 3345 3350 3355 3360  
 Gln Val Arg Arg Leu Ile Gly Asn Glu Asn Tyr Leu Asp Phe Met Thr  
 3365 3370 3375  
 Ser Met Lys Arg Phe Lys Asn Glu Ser Asp Pro Glu Gly Ala Leu Trp  
 3380 3385 3390

<210> 21  
 <211> 3391  
 <212> PRT

<213> Dengue 2 virus strain NGC

<400> 21

Met	Asn	Asn	Gln	Arg	Lys	Lys	Ala	Arg	Asn	Thr	Pro	Phe	Asn	Met	Leu
1				5					10					15	
Lys	Arg	Glu	Arg	Asn	Arg	Val	Ser	Thr	Val	Gln	Gln	Leu	Thr	Lys	Arg
			20					25					30		
Phe	Ser	Leu	Gly	Met	Leu	Gln	Gly	Arg	Gly	Pro	Leu	Lys	Leu	Phe	Met
		35					40					45			
Ala	Leu	Val	Ala	Phe	Leu	Arg	Phe	Leu	Thr	Ile	Pro	Pro	Thr	Ala	Gly
	50					55					60				
Ile	Leu	Lys	Arg	Trp	Gly	Thr	Ile	Lys	Lys	Ser	Lys	Ala	Ile	Asn	Val
65					70					75					80
Leu	Arg	Gly	Phe	Arg	Lys	Glu	Ile	Gly	Arg	Met	Leu	Asn	Ile	Leu	Asn
				85					90					95	
Arg	Arg	Arg	Arg	Thr	Ala	Gly	Met	Ile	Ile	Met	Leu	Ile	Pro	Thr	Val
			100					105					110		
Met	Ala	Phe	His	Leu	Thr	Thr	Arg	Asn	Gly	Glu	Pro	His	Met	Ile	Val
		115					120					125			
Ser	Arg	Gln	Glu	Lys	Gly	Lys	Ser	Leu	Leu	Phe	Lys	Thr	Glu	Asp	Gly
	130					135					140				
Val	Asn	Met	Cys	Thr	Leu	Met	Ala	Met	Asp	Leu	Gly	Glu	Leu	Cys	Glu
145					150					155					160
Asp	Thr	Ile	Thr	Tyr	Lys	Cys	Pro	Phe	Leu	Arg	Gln	Asn	Glu	Pro	Glu
				165					170					175	
Asp	Ile	Asp	Cys	Trp	Cys	Asn	Ser	Thr	Ser	Thr	Trp	Val	Thr	Tyr	Gly
			180					185					190		
Thr	Cys	Thr	Thr	Thr	Gly	Glu	His	Arg	Arg	Glu	Lys	Arg	Ser	Val	Ala
		195					200					205			
Leu	Val	Pro	His	Val	Gly	Met	Gly	Leu	Glu	Thr	Arg	Thr	Glu	Thr	Trp
	210					215					220				
Met	Ser	Ser	Glu	Gly	Ala	Trp	Lys	His	Ala	Gln	Arg	Ile	Glu	Thr	Trp
225					230					235					240
Ile	Leu	Arg	His	Pro	Gly	Phe	Thr	Ile	Met	Ala	Ala	Ile	Leu	Ala	Tyr
				245					250					255	
Thr	Ile	Gly	Thr	Thr	His	Phe	Gln	Arg	Ala	Leu	Ile	Phe	Ile	Leu	Leu
			260					265					270		
Thr	Ala	Val	Ala	Pro	Ser	Met	Thr	Met	Arg	Cys	Ile	Gly	Ile	Ser	Asn
		275					280					285			
Arg	Asp	Phe	Val	Glu	Gly	Val	Ser	Gly	Gly	Ser	Trp	Val	Asp	Ile	Val
	290					295					300				
Leu	Glu	His	Gly	Ser	Cys	Val	Thr	Thr	Met	Ala	Lys	Asn	Lys	Pro	Thr
305					310					315					320
Leu	Asp	Phe	Glu	Leu	Ile	Lys	Thr	Glu	Ala	Lys	Gln	Pro	Ala	Thr	Leu
				325					330					335	
Arg	Lys	Tyr	Cys	Ile	Glu	Ala	Lys	Leu	Thr	Asn	Thr	Thr	Thr	Asp	Ser
			340					345					350		
Arg	Cys	Pro	Thr	Gln	Gly	Glu	Pro	Ser	Leu	Asn	Glu	Glu	Gln	Asp	Lys
		355					360					365			
Arg	Phe	Val	Cys	Lys	His	Ser	Met	Val	Asp	Arg	Gly	Trp	Gly	Asn	Gly
	370					375					380				
Cys	Gly	Leu	Phe	Gly	Lys	Gly	Gly	Ile	Val	Thr	Cys	Ala	Met	Phe	Thr
385					390					395					400
Cys	Lys	Lys	Asn	Met	Lys	Gly	Lys	Val	Val	Gln	Pro	Glu	Asn	Leu	Glu
				405					410					415	
Tyr	Thr	Ile	Val	Ile	Thr	Pro	His	Ser	Gly	Glu	Glu	His	Ala	Val	Gly
			420					425					430		
Asn	Asp	Thr	Gly	Lys	His	Gly	Lys	Glu	Ile	Lys	Ile	Thr	Pro	Gln	Ser
		435					440					445			
Ser	Ile	Thr	Glu	Ala	Glu	Leu	Thr	Gly	Tyr	Gly	Thr	Val	Thr	Met	Glu
	450					455					460				

Cys	Ser	Pro	Arg	Thr	Gly	Leu	Asp	Phe	Asn	Glu	Met	Val	Leu	Leu	Gln
465					470					475					480
Met	Glu	Asn	Lys	Ala	Trp	Leu	Val	His	Arg	Gln	Trp	Phe	Leu	Asp	Leu
				485					490					495	
Pro	Leu	Pro	Trp	Leu	Pro	Gly	Ala	Asp	Thr	Gln	Gly	Ser	Asn	Trp	Ile
			500					505					510		
Gln	Lys	Glu	Thr	Leu	Val	Thr	Phe	Lys	Asn	Pro	His	Ala	Lys	Lys	Gln
		515					520					525			
Asp	Val	Val	Val	Leu	Gly	Ser	Gln	Glu	Gly	Ala	Met	His	Thr	Ala	Leu
	530					535					540				
Thr	Gly	Ala	Thr	Glu	Ile	Gln	Met	Ser	Ser	Gly	Asn	Leu	Leu	Phe	Thr
545					550					555					560
Gly	His	Leu	Lys	Cys	Arg	Leu	Arg	Met	Asp	Lys	Leu	Gln	Leu	Lys	Gly
				565					570					575	
Met	Ser	Tyr	Ser	Met	Cys	Thr	Gly	Lys	Phe	Lys	Val	Val	Lys	Glu	Ile
			580					585					590		
Ala	Glu	Thr	Gln	His	Gly	Thr	Ile	Val	Ile	Arg	Val	Gln	Tyr	Glu	Gly
		595					600					605			
Asp	Gly	Ser	Pro	Cys	Lys	Ile	Pro	Phe	Glu	Ile	Met	Asp	Leu	Glu	Lys
	610					615					620				
Arg	His	Val	Leu	Gly	Arg	Leu	Ile	Thr	Val	Asn	Pro	Ile	Val	Thr	Glu
625					630					635					640
Lys	Asp	Ser	Pro	Val	Asn	Ile	Glu	Ala	Glu	Pro	Pro	Phe	Gly	Asp	Ser
				645					650					655	
Tyr	Ile	Ile	Ile	Gly	Val	Glu	Pro	Gly	Gln	Leu	Lys	Leu	Asn	Trp	Phe
			660					665					670		
Lys	Lys	Gly	Ser	Ser	Ile	Gly	Gln	Met	Ile	Glu	Thr	Thr	Met	Arg	Gly
		675					680					685			
Ala	Lys	Arg	Met	Ala	Ile	Leu	Gly	Asp	Thr	Ala	Trp	Asp	Phe	Gly	Ser
	690					695					700				
Leu	Gly	Gly	Val	Phe	Thr	Ser	Ile	Gly	Lys	Ala	Leu	His	Gln	Val	Phe
705					710					715					720
Gly	Ala	Ile	Tyr	Gly	Ala	Ala	Phe	Ser	Gly	Val	Ser	Trp	Thr	Met	Lys
				725					730					735	
Ile	Leu	Ile	Gly	Val	Ile	Ile	Thr	Trp	Ile	Gly	Met	Asn	Ser	Arg	Ser
			740					745					750		
Thr	Ser	Leu	Ser	Val	Ser	Leu	Val	Leu	Val	Gly	Val	Val	Thr	Leu	Tyr
		755					760					765			
Leu	Gly	Val	Met	Val	Gln	Ala	Asp	Ser	Gly	Cys	Val	Val	Ser	Trp	Lys
	770					775					780				
Asn	Lys	Glu	Leu	Lys	Cys	Gly	Ser	Gly	Ile	Phe	Ile	Thr	Asp	Asn	Val
785					790					795					800
His	Thr	Trp	Thr	Glu	Gln	Tyr	Lys	Phe	Gln	Pro	Glu	Ser	Pro	Ser	Lys
				805					810					815	
Leu	Ala	Ser	Ala	Ile	Gln	Lys	Ala	His	Glu	Glu	Gly	Ile	Cys	Gly	Ile
			820					825					830		
Arg	Ser	Val	Thr	Arg	Leu	Glu	Asn	Leu	Met	Trp	Lys	Gln	Ile	Thr	Pro
		835					840					845			
Glu	Leu	Asn	His	Ile	Leu	Ser	Glu	Asn	Glu	Val	Lys	Leu	Thr	Ile	Met
	850					855					860				
Thr	Gly	Asp	Ile	Lys	Gly	Ile	Met	Gln	Ala	Gly	Lys	Arg	Ser	Leu	Gln
865					870					875					880
Pro	Gln	Pro	Thr	Glu	Leu	Lys	Tyr	Ser	Trp	Lys	Thr	Trp	Gly	Lys	Ala
				885					890					895	
Lys	Met	Leu	Ser	Thr	Glu	Ser	His	Asn	Gln	Thr	Phe	Leu	Ile	Asp	Gly
			900					905					910		
Pro	Glu	Thr	Ala	Glu	Cys	Pro	Asn	Thr	Asn	Arg	Ala	Trp	Asn	Ser	Leu
		915					920					925			
Glu	Val	Glu	Asp	Tyr	Gly	Phe	Gly	Val	Phe	Thr	Thr	Asn	Ile	Trp	Leu
	930					935					940				
Lys	Leu	Arg	Glu	Lys	Gln	Asp	Val	Phe	Cys	Asp	Ser	Lys	Leu	Met	Ser

945		950		955		960
Ala Ala Ile Lys Asp	Asn Arg Ala Val His	Ala Asp Met Gly Tyr Trp				
	965	970				
Ile Glu Ser Ala Leu	Asn Asp Thr Trp Lys	Ile Glu Lys Ala Ser Phe				
	980	985				
Ile Glu Val Lys Ser	Cys His Trp Pro Lys	Ser His Thr Leu Trp Ser				
	995	1000				
Asn Gly Val Leu Glu	Ser Glu Met Ile Ile	Pro Lys Asn Phe Ala Gly				
	1010	1015				
Pro Val Ser Gln His	Asn Tyr Arg Pro Gly	Tyr His Thr Gln Thr Ala				
	1025	1030				
Gly Pro Trp Trp His	Leu Gly Lys Leu Glu	Met Asp Phe Asp Phe Cys Glu				
	1045	1050				
Gly Thr Thr Val Val	Val Thr Glu Asp Cys	Gly Asn Arg Gly Pro Ser				
	1060	1065				
Leu Arg Thr Thr Thr	Ala Ser Gly Lys Leu	Ile Thr Glu Trp Cys Cys				
	1075	1080				
Arg Ser Cys Thr Leu	Pro Pro Leu Arg Tyr	Arg Gly Glu Asp Gly Cys				
	1090	1095				
Trp Tyr Gly Met Glu	Ile Arg Pro Leu Lys	Glu Lys Glu Glu Asn Leu				
	1105	1110				
Val Asn Ser Leu Val	Thr Ala Gly His Gly	Gln Ile Asp Asn Phe Ser				
	1125	1130				
Leu Gly Val Leu Gly	Met Ala Leu Phe Leu	Glu Glu Met Leu Arg Thr				
	1140	1145				
Arg Val Gly Thr Lys	His Ala Ile Leu Leu	Val Ala Val Ser Phe Val				
	1155	1160				
Thr Leu Ile Thr Gly	Asn Met Ser Phe Arg	Asp Leu Gly Arg Val Met				
	1170	1175				
Val Met Val Gly Ala	Thr Met Thr Asp Asp	Ile Gly Met Gly Val Thr				
	1185	1190				
Tyr Leu Ala Leu Leu	Ala Ala Phe Lys Val	Arg Pro Thr Phe Ala Ala				
	1205	1210				
Gly Leu Leu Leu Arg	Lys Leu Thr Ser Lys	Glu Leu Met Met Thr Thr				
	1220	1225				
Ile Gly Ile Val Leu	Leu Ser Gln Ser Thr	Ile Pro Glu Thr Ile Leu				
	1235	1240				
Glu Leu Thr Asp Ala	Leu Ala Leu Gly Met	Met Val Leu Lys Met Val				
	1250	1255				
Arg Lys Met Glu Lys	Tyr Gln Leu Ala Val	Thr Ile Met Ala Ile Leu				
	1265	1270				
Cys Val Pro Asn Ala	Val Ile Leu Gln Asn	Ala Trp Lys Val Ser Cys				
	1285	1290				
Thr Ile Leu Ala Val	Val Ser Val Ser Pro	Leu Phe Leu Thr Ser Ser				
	1300	1305				
Gln Gln Lys Ala Asp	Trp Ile Pro Leu Ala	Leu Thr Ile Lys Gly Leu				
	1315	1320				
Asn Pro Thr Ala Ile	Phe Leu Thr Thr Leu	Ser Arg Thr Asn Lys Lys				
	1330	1335				
Arg Ser Trp Pro Leu	Asn Glu Ala Ile Met	Ala Val Gly Met Val Ser				
	1345	1350				
Ile Leu Ala Ser Ser	Leu Leu Lys Asn Asp	Ile Pro Met Thr Gly Pro				
	1365	1370				
Leu Val Ala Gly Leu	Leu Thr Val Cys Tyr	Val Leu Thr Gly Arg				
	1380	1385				
Ser Ala Asp Leu Glu	Leu Glu Arg Ala Ala	Asp Val Lys Trp Glu Asp				
	1395	1400				
Gln Ala Glu Ile Ser	Gly Ser Ser Pro Ile	Leu Ser Ile Thr Ile Ser				
	1410	1415				
Glu Asp Gly Ser Met	Ser Ile Lys Asn Glu	Glu Glu Glu Gln Thr Leu				
	1425	1430				
		1435				1440

Thr Ile Leu Ile Arg Thr Gly Leu Leu Val Ile Ser Gly Leu Phe Pro  
 1445 1450 1455  
 Val Ser Ile Pro Ile Thr Ala Ala Ala Trp Tyr Leu Trp Glu Val Lys  
 1460 1465 1470  
 Lys Gln Arg Ala Gly Val Leu Trp Asp Val Pro Ser Pro Pro Val  
 1475 1480 1485  
 Gly Lys Ala Glu Leu Glu Asp Gly Ala Tyr Arg Ile Lys Gln Lys Gly  
 1490 1495 1500  
 Ile Leu Gly Tyr Ser Gln Ile Gly Ala Gly Val Tyr Lys Glu Gly Thr  
 1505 1510 1515 1520  
 Phe His Thr Met Trp His Val Thr Arg Gly Ala Val Leu Met His Lys  
 1525 1530 1535  
 Gly Lys Arg Ile Glu Pro Ser Trp Ala Asp Val Lys Lys Asp Leu Ile  
 1540 1545 1550  
 Ser Tyr Gly Gly Gly Trp Lys Leu Glu Gly Glu Trp Lys Glu Gly Glu  
 1555 1560 1565  
 Glu Val Gln Val Leu Ala Leu Glu Pro Gly Lys Asn Pro Arg Ala Val  
 1570 1575 1580  
 Gln Thr Lys Pro Gly Leu Phe Lys Thr Asn Ala Gly Thr Ile Gly Ala  
 1585 1590 1595 1600  
 Val Ser Leu Asp Phe Ser Pro Gly Thr Ser Gly Ser Pro Ile Ile Asp  
 1605 1610 1615  
 Lys Lys Gly Lys Val Val Gly Leu Tyr Gly Asn Gly Val Val Thr Arg  
 1620 1625 1630  
 Ser Gly Ala Tyr Val Ser Ala Ile Ala Gln Thr Glu Lys Ser Ile Glu  
 1635 1640 1645  
 Asp Asn Pro Glu Ile Glu Asp Asp Ile Phe Arg Lys Arg Lys Leu Thr  
 1650 1655 1660  
 Ile Met Asp Leu His Pro Gly Ala Gly Lys Thr Lys Arg Tyr Leu Pro  
 1665 1670 1675 1680  
 Ala Ile Val Arg Glu Ala Ile Lys Arg Gly Leu Arg Thr Leu Ile Leu  
 1685 1690 1695  
 Ala Pro Thr Arg Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly  
 1700 1705 1710  
 Leu Pro Ile Arg Tyr Gln Thr Pro Ala Ile Arg Ala Glu His Thr Gly  
 1715 1720 1725  
 Arg Glu Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Met Arg Leu  
 1730 1735 1740  
 Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Leu Ile Ile Met Asp Glu  
 1745 1750 1755 1760  
 Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly Tyr Ile Ser  
 1765 1770 1775  
 Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe Met Thr Ala Thr  
 1780 1785 1790  
 Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser Asn Ala Pro Ile Met  
 1795 1800 1805  
 Asp Glu Glu Arg Glu Ile Pro Glu Arg Ser Trp Ser Ser Gly His Glu  
 1810 1815 1820  
 Trp Val Thr Asp Phe Lys Gly Lys Thr Val Trp Phe Val Pro Ser Ile  
 1825 1830 1835 1840  
 Lys Ala Gly Asn Asp Ile Ala Ala Cys Leu Arg Lys Asn Gly Lys Lys  
 1845 1850 1855  
 Val Ile Gln Leu Ser Arg Lys Thr Phe Asp Ser Glu Tyr Val Lys Thr  
 1860 1865 1870  
 Arg Thr Asn Asp Trp Asp Phe Val Val Thr Thr Asp Ile Ser Glu Met  
 1875 1880 1885  
 Gly Ala Asn Phe Lys Ala Glu Arg Val Ile Asp Pro Arg Arg Cys Met  
 1890 1895 1900  
 Lys Pro Val Ile Leu Thr Asp Gly Glu Glu Arg Val Ile Leu Ala Gly  
 1905 1910 1915 1920  
 Pro Met Pro Val Thr His Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile

1925					1930					1935					
Gly	Arg	Asn	Pro	Lys	Asn	Glu	Asn	Asp	Gln	Tyr	Ile	Tyr	Met	Gly	Glu
1940					1945					1950					
Pro	Leu	Glu	Asn	Asp	Glu	Asp	Cys	Ala	His	Trp	Lys	Glu	Ala	Lys	Met
1955					1960					1965					
Leu	Leu	Asp	Asn	Ile	Asn	Thr	Pro	Glu	Gly	Ile	Ile	Pro	Ser	Met	Phe
1970					1975					1980					
Glu	Pro	Glu	Arg	Glu	Lys	Val	Asp	Ala	Ile	Asp	Gly	Glu	Tyr	Arg	Leu
1985					1990					1995					
Arg	Gly	Glu	Ala	Arg	Lys	Thr	Phe	Val	Asp	Leu	Met	Arg	Arg	Gly	Asp
2005					2010					2015					
Leu	Pro	Val	Trp	Leu	Ala	Tyr	Arg	Val	Ala	Ala	Glu	Gly	Ile	Asn	Tyr
2020					2025					2030					
Ala	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Ile	Lys	Asn	Asn	Gln	Ile	Leu
2035					2040					2045					
Glu	Glu	Asn	Val	Glu	Val	Glu	Ile	Trp	Thr	Lys	Glu	Gly	Glu	Arg	Lys
2050					2055					2060					
Lys	Leu	Lys	Pro	Arg	Trp	Leu	Asp	Ala	Arg	Ile	Tyr	Ser	Asp	Pro	Leu
2065					2070					2075					
Thr	Leu	Lys	Glu	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Arg	Lys	Ser	Leu	Thr
2085					2090					2095					
Leu	Asn	Leu	Ile	Thr	Glu	Met	Gly	Arg	Leu	Pro	Thr	Phe	Met	Thr	Gln
2100					2105					2110					
Lys	Ala	Arg	Asp	Ala	Leu	Asp	Asn	Leu	Ala	Val	Leu	His	Thr	Ala	Glu
2115					2120					2125					
Ala	Gly	Gly	Arg	Ala	Tyr	Asn	His	Ala	Leu	Ser	Glu	Leu	Pro	Glu	Thr
2130					2135					2140					
Leu	Glu	Thr	Leu	Leu	Leu	Leu	Thr	Leu	Leu	Ala	Thr	Val	Thr	Gly	Gly
2145					2150					2155					
Ile	Phe	Leu	Phe	Leu	Met	Ser	Gly	Arg	Gly	Ile	Gly	Lys	Met	Thr	Leu
2165					2170					2175					
Gly	Met	Cys	Cys	Ile	Ile	Thr	Ala	Ser	Ile	Leu	Leu	Trp	Tyr	Ala	Gln
2180					2185					2190					
Ile	Gln	Pro	His	Trp	Ile	Ala	Ala	Ser	Ile	Ile	Leu	Glu	Phe	Phe	Leu
2195					2200					2205					
Ile	Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp
2210					2215					2220					
Asn	Gln	Leu	Thr	Tyr	Val	Val	Ile	Ala	Ile	Leu	Thr	Val	Val	Ala	Ala
2225					2230					2235					
Thr	Met	Ala	Asn	Glu	Met	Gly	Phe	Leu	Glu	Lys	Thr	Lys	Lys	Asp	Leu
2245					2250					2255					
Gly	Leu	Gly	Ser	Ile	Thr	Thr	Gln	Gln	Pro	Glu	Ser	Asn	Ile	Leu	Asp
2260					2265					2270					
Ile	Asp	Leu	Arg	Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr	Ala	Val	Ala	Thr
2275					2280					2285					
Thr	Phe	Val	Thr	Pro	Met	Leu	Arg	His	Ser	Ile	Glu	Asn	Ser	Ser	Val
2290					2295					2300					
Asn	Val	Ser	Leu	Thr	Ala	Ile	Ala	Asn	Gln	Ala	Thr	Val	Leu	Met	Gly
2305					2310					2315					
Leu	Gly	Lys	Gly	Trp	Pro	Leu	Ser	Lys	Met	Asp	Ile	Gly	Val	Pro	Leu
2325					2330					2335					
Leu	Ala	Ile	Gly	Cys	Tyr	Ser	Gln	Val	Asn	Pro	Ile	Thr	Leu	Thr	Ala
2340					2345					2350					
Ala	Leu	Phe	Leu	Leu	Val	Ala	His	Tyr	Ala	Ile	Ile	Gly	Pro	Gly	Leu
2355					2360					2365					
Gln	Ala	Lys	Ala	Thr	Arg	Glu	Ala	Gln	Lys	Arg	Ala	Ala	Ala	Gly	Ile
2370					2375					2380					
Met	Lys	Asn	Pro	Thr	Val	Asp	Gly	Ile	Thr	Val	Ile	Asp	Leu	Asp	Pro
2385					2390					2395					
Ile	Pro	Tyr	Asp	Pro	Lys	Phe	Glu	Lys	Gln	Leu	Gly	Gln	Val	Met	Leu
2405					2410					2415					

Leu Val Leu Cys Val Thr Gln Val Leu Met Met Arg Thr Thr Trp Ala  
 2420 2425 2430  
 Leu Cys Glu Ala Leu Thr Leu Ala Thr Gly Pro Ile Ser Thr Leu Trp  
 2435 2440 2445  
 Glu Gly Asn Pro Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser Met  
 2450 2455 2460  
 Ala Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Gly Leu Leu Phe  
 2465 2470 2475 2480  
 Ser Ile Met Lys Asn Thr Thr Asn Thr Arg Arg Gly Thr Gly Asn Ile  
 2485 2490 2495  
 Gly Glu Thr Leu Gly Glu Lys Trp Lys Ser Arg Leu Asn Ala Leu Gly  
 2500 2505 2510  
 Lys Ser Glu Phe Gln Ile Tyr Lys Lys Ser Gly Ile Gln Glu Val Asp  
 2515 2520 2525  
 Arg Thr Leu Ala Lys Glu Gly Ile Lys Arg Gly Glu Thr Asp His His  
 2530 2535 2540  
 Ala Val Ser Arg Gly Ser Ala Lys Leu Arg Trp Phe Val Glu Arg Asn  
 2545 2550 2555 2560  
 Met Val Thr Pro Glu Gly Lys Val Val Asp Leu Gly Cys Gly Arg Gly  
 2565 2570 2575  
 Gly Trp Ser Tyr Trp Cys Gly Gly Leu Lys Asn Val Arg Glu Val Lys  
 2580 2585 2590  
 Gly Leu Thr Lys Gly Gly Pro Gly His Glu Glu Pro Ile Pro Met Ser  
 2595 2600 2605  
 Thr Tyr Gly Trp Asn Leu Val Arg Leu Gln Ser Gly Val Asp Val Phe  
 2610 2615 2620  
 Phe Thr Pro Pro Glu Lys Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu  
 2625 2630 2635 2640  
 Ser Ser Pro Asn Pro Thr Val Glu Ala Gly Arg Thr Leu Arg Val Leu  
 2645 2650 2655  
 Asn Leu Val Glu Asn Trp Leu Asn Asn Asn Thr Gln Phe Cys Ile Lys  
 2660 2665 2670  
 Val Leu Asn Pro Tyr Met Pro Ser Val Ile Glu Lys Met Glu Ala Leu  
 2675 2680 2685  
 Gln Arg Lys Tyr Gly Gly Ala Leu Val Arg Asn Pro Leu Ser Arg Asn  
 2690 2695 2700  
 Ser Thr His Glu Met Tyr Trp Val Ser Asn Ala Ser Gly Asn Ile Val  
 2705 2710 2715 2720  
 Ser Ser Val Asn Met Ile Ser Arg Met Leu Ile Asn Arg Phe Thr Met  
 2725 2730 2735  
 Arg His Lys Lys Ala Thr Tyr Glu Pro Asp Val Asp Leu Gly Ser Gly  
 2740 2745 2750  
 Thr Arg Asn Ile Gly Ile Glu Ser Glu Ile Pro Asn Leu Asp Ile Ile  
 2755 2760 2765  
 Gly Lys Arg Ile Glu Lys Ile Lys Gln Glu His Glu Thr Ser Trp His  
 2770 2775 2780  
 Tyr Asp Gln Asp His Pro Tyr Lys Thr Trp Ala Tyr His Gly Ser Tyr  
 2785 2790 2795 2800  
 Glu Thr Lys Gln Thr Gly Ser Ala Ser Ser Met Val Asn Gly Val Val  
 2805 2810 2815  
 Arg Leu Leu Thr Lys Pro Trp Asp Val Val Pro Met Val Thr Gln Met  
 2820 2825 2830  
 Ala Met Thr Asp Thr Thr Pro Phe Gly Gln Gln Arg Val Phe Lys Glu  
 2835 2840 2845  
 Lys Val Asp Thr Arg Thr Gln Glu Pro Lys Glu Gly Thr Lys Lys Leu  
 2850 2855 2860  
 Met Lys Ile Thr Ala Glu Trp Leu Trp Lys Glu Leu Gly Lys Lys Lys  
 2865 2870 2875 2880  
 Thr Pro Arg Met Cys Thr Arg Glu Glu Phe Thr Arg Lys Val Arg Ser  
 2885 2890 2895  
 Asn Ala Ala Leu Gly Ala Ile Phe Thr Asp Glu Asn Lys Trp Lys Ser

2900					2905					2910					
Ala	Arg	Glu	Ala	Val	Glu	Asp	Ser	Arg	Phe	Trp	Glu	Leu	Val	Asp	Lys
2915					2920					2925					
Glu	Arg	Asn	Leu	His	Leu	Glu	Gly	Lys	Cys	Glu	Thr	Cys	Val	Tyr	Asn
2930					2935					2940					
Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Leu	Gly	Glu	Phe	Gly	Lys	Ala	Lys
2945					2950					2955					
Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg	Phe	Leu	Glu
2965					2970					2975					
Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp	Phe	Ser	Arg	Glu
2980					2985					2990					
Asn	Ser	Leu	Ser	Gly	Val	Glu	Gly	Gly	Leu	His	Lys	Leu	Gly	Tyr	
2995					3000					3005					
Ile	Leu	Arg	Asp	Val	Ser	Lys	Lys	Glu	Gly	Gly	Ala	Met	Tyr	Ala	Asp
3010					3015					3020					
Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile	Thr	Leu	Glu	Asp	Leu	Lys	Asn
3025					3030					3035					
Glu	Glu	Met	Val	Thr	Asn	His	Met	Glu	Gly	Glu	His	Lys	Lys	Leu	Ala
3045					3050					3055					
Glu	Ala	Ile	Phe	Lys	Leu	Thr	Tyr	Gln	Asn	Lys	Val	Val	Arg	Val	Gln
3060					3065					3070					
Arg	Pro	Thr	Pro	Arg	Gly	Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Arg	Asp
3075					3080					3085					
Gln	Arg	Gly	Ser	Gly	Gln	Val	Gly	Thr	Tyr	Gly	Leu	Asn	Thr	Phe	Thr
3090					3095					3100					
Asn	Met	Glu	Ala	Gln	Leu	Ile	Arg	Gln	Met	Glu	Gly	Glu	Gly	Val	Phe
3105					3110					3115					
Lys	Ser	Ile	Gln	His	Leu	Thr	Val	Thr	Glu	Glu	Ile	Ala	Val	Gln	Asn
3125					3130					3135					
Trp	Leu	Ala	Arg	Val	Gly	Arg	Glu	Arg	Leu	Ser	Arg	Met	Ala	Ile	Ser
3140					3145					3150					
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Leu	Asp	Asp	Arg	Phe	Ala	Ser	Ala
3155					3160					3165					
Leu	Thr	Ala	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Ile	Gln	Gln
3170					3175					3180					
Trp	Glu	Pro	Ser	Arg	Gly	Trp	Asn	Asp	Trp	Thr	Gln	Val	Pro	Phe	Cys
3185					3190					3195					
Ser	His	His	Phe	His	Glu	Leu	Ile	Met	Lys	Asp	Gly	Arg	Val	Leu	Val
3205					3210					3215					
Val	Pro	Cys	Arg	Asn	Gln	Asp	Glu	Leu	Ile	Gly	Arg	Ala	Arg	Ile	Ser
3220					3225					3230					
Gln	Gly	Ala	Gly	Trp	Ser	Leu	Arg	Glu	Thr	Ala	Cys	Leu	Gly	Lys	Ser
3235					3240					3245					
Tyr	Ala	Gln	Met	Trp	Ser	Leu	Met	Tyr	Phe	His	Arg	Arg	Asp	Leu	Arg
3250					3255					3260					
Leu	Ala	Ala	Asn	Ala	Ile	Cys	Ser	Ala	Val	Pro	Ser	His	Trp	Val	Pro
3265					3270					3275					
Thr	Ser	Arg	Thr	Thr	Trp	Ser	Ile	His	Ala	Lys	His	Glu	Trp	Met	Thr
3285					3290					3295					
Thr	Glu	Asp	Met	Leu	Thr	Val	Trp	Asn	Arg	Val	Trp	Ile	Gln	Glu	Asn
3300					3305					3310					
Pro	Trp	Met	Glu	Asp	Lys	Thr	Pro	Val	Glu	Ser	Trp	Glu	Glu	Ile	Pro
3315					3320					3325					
Tyr	Leu	Gly	Lys	Arg	Glu	Asp	Gln	Trp	Cys	Gly	Ser	Leu	Ile	Gly	Leu
3330					3335					3340					
Thr	Ser	Arg	Ala	Thr	Trp	Ala	Lys	Asn	Ile	Gln	Thr	Ala	Ile	Asn	Gln
3345					3350					3355					
Val	Arg	Ser	Leu	Ile	Gly	Asn	Glu	Glu	Tyr	Thr	Asp	Tyr	Met	Pro	Ser
3365					3370					3375					
Met	Lys	Arg	Phe	Arg	Arg	Glu	Glu	Glu	Glu	Ala	Gly	Val	Leu	Trp	
3380					3385					3390					



<210> 22  
 <211> 3390  
 <212> PRT  
 <213> Dengue 3 virus strain H87

<400> 22

Met	Asn	Asn	Gln	Arg	Lys	Lys	Thr	Gly	Lys	Pro	Ser	Ile	Asn	Met	Leu
1				5					10					15	
Lys	Arg	Val	Arg	Asn	Arg	Val	Ser	Thr	Gly	Ser	Gln	Leu	Ala	Lys	Arg
			20					25					30		
Phe	Ser	Arg	Gly	Leu	Leu	Asn	Gly	Gln	Gly	Pro	Met	Lys	Leu	Val	Met
		35					40					45			
Ala	Phe	Ile	Ala	Phe	Leu	Arg	Phe	Leu	Ala	Ile	Pro	Pro	Thr	Ala	Gly
	50					55					60				
Val	Leu	Ala	Arg	Trp	Gly	Thr	Phe	Lys	Lys	Ser	Gly	Ala	Ile	Lys	Val
65					70					75					80
Leu	Lys	Gly	Phe	Lys	Lys	Glu	Ile	Ser	Asn	Met	Leu	Ser	Ile	Ile	Asn
				85					90					95	
Lys	Arg	Lys	Lys	Thr	Ser	Leu	Cys	Leu	Met	Met	Met	Leu	Pro	Ala	Thr
			100					105					110		
Leu	Ala	Phe	His	Leu	Thr	Ser	Arg	Asp	Gly	Glu	Pro	Arg	Met	Ile	Val
		115					120					125			
Gly	Lys	Asn	Glu	Arg	Gly	Lys	Ser	Leu	Leu	Phe	Lys	Thr	Ala	Ser	Gly
	130					135					140				
Ile	Asn	Met	Cys	Thr	Leu	Ile	Ala	Met	Asp	Leu	Gly	Glu	Met	Cys	Asp
145					150				155						160
Asp	Thr	Val	Thr	Tyr	Lys	Cys	Pro	His	Ile	Thr	Glu	Val	Glu	Pro	Glu
				165					170					175	
Asp	Ile	Asp	Cys	Trp	Cys	Asn	Leu	Thr	Ser	Thr	Trp	Val	Thr	Tyr	Gly
		180						185					190		
Thr	Cys	Asn	Gln	Ala	Gly	Glu	His	Arg	Arg	Asp	Lys	Arg	Ser	Val	Ala
		195					200					205			
Leu	Ala	Pro	His	Val	Gly	Met	Gly	Leu	Asp	Thr	Arg	Thr	Gln	Thr	Trp
	210					215					220				
Met	Ser	Ala	Glu	Gly	Ala	Trp	Arg	Gln	Val	Glu	Lys	Val	Glu	Thr	Trp
225					230					235					240
Ala	Leu	Arg	His	Pro	Gly	Phe	Thr	Ile	Leu	Ala	Leu	Phe	Leu	Ala	His
				245					250					255	
Tyr	Ile	Gly	Thr	Ser	Leu	Thr	Gln	Lys	Val	Val	Ile	Phe	Ile	Leu	Leu
			260					265					270		
Met	Leu	Val	Thr	Pro	Ser	Met	Thr	Met	Arg	Cys	Val	Gly	Val	Gly	Asn
		275					280					285			
Arg	Asp	Phe	Val	Glu	Gly	Leu	Ser	Gly	Ala	Thr	Trp	Val	Asp	Val	Val
	290					295					300				
Leu	Glu	His	Gly	Gly	Cys	Val	Thr	Thr	Met	Ala	Lys	Asn	Lys	Pro	Thr
305					310					315					320
Leu	Asp	Ile	Glu	Leu	Gln	Lys	Thr	Glu	Ala	Thr	Gln	Leu	Ala	Thr	Leu
				325					330					335	
Arg	Lys	Leu	Cys	Ile	Glu	Gly	Lys	Ile	Thr	Asn	Ile	Thr	Thr	Asp	Ser
			340					345					350		
Arg	Cys	Pro	Thr	Gln	Gly	Glu	Ala	Ile	Leu	Pro	Glu	Glu	Gln	Asp	Gln
		355					360					365			
Asn	Tyr	Val	Cys	Lys	His	Thr	Tyr	Val	Asp	Arg	Gly	Trp	Gly	Asn	Gly
	370					375					380				
Cys	Gly	Leu	Phe	Gly	Lys	Gly	Ser	Leu	Val	Thr	Cys	Ala	Lys	Phe	Gln
385					390					395					400
Cys	Leu	Glu	Ser	Ile	Glu	Gly	Lys	Val	Val	Gln	His	Glu	Asn	Leu	Lys
				405					410					415	
Tyr	Thr	Val	Ile	Ile	Thr	Val	His	Thr	Gly	Asp	Gln	His	Gln	Val	Gly

				420				425				430			
Asn	Glu	Thr	Gln	Gly	Val	Thr	Ala	Glu	Ile	Thr	Ser	Gln	Ala	Ser	Thr
435				440				445							
Ala	Glu	Ala	Ile	Leu	Pro	Glu	Tyr	Gly	Thr	Leu	Gly	Leu	Glu	Cys	Ser
450				455				460							
Pro	Arg	Thr	Gly	Leu	Asp	Phe	Asn	Glu	Met	Ile	Leu	Leu	Thr	Met	Lys
465					470					475					
Asn	Lys	Ala	Trp	Met	Val	His	Arg	Gln	Trp	Phe	Phe	Asp	Leu	Pro	Leu
485				490				495							
Pro	Trp	Thr	Ser	Gly	Ala	Thr	Thr	Lys	Thr	Pro	Thr	Trp	Asn	Arg	Lys
500				505				510							
Glu	Leu	Leu	Val	Thr	Phe	Lys	Asn	Ala	His	Ala	Lys	Lys	Gln	Glu	Val
515				520				525							
Val	Val	Leu	Gly	Ser	Gln	Glu	Gly	Ala	Met	His	Thr	Ala	Leu	Thr	Gly
530				535				540							
Ala	Thr	Glu	Ile	Gln	Thr	Ser	Gly	Gly	Thr	Ser	Ile	Phe	Ala	Gly	His
545					550					555					
Leu	Lys	Cys	Arg	Leu	Lys	Met	Asp	Lys	Leu	Lys	Leu	Lys	Gly	Met	Ser
565				570				575							
Tyr	Ala	Met	Cys	Leu	Asn	Thr	Phe	Val	Leu	Lys	Lys	Glu	Val	Ser	Glu
580				585				590							
Thr	Gln	His	Gly	Thr	Ile	Leu	Ile	Lys	Val	Glu	Tyr	Lys	Gly	Glu	Asp
595				600				605							
Ala	Pro	Cys	Lys	Ile	Pro	Phe	Ser	Thr	Glu	Asp	Gly	Gln	Gly	Lys	Ala
610				615				620							
His	Asn	Gly	Arg	Leu	Ile	Thr	Ala	Asn	Pro	Val	Val	Thr	Lys	Lys	Glu
625					630					635					
Glu	Pro	Val	Asn	Ile	Glu	Ala	Glu	Pro	Pro	Phe	Gly	Glu	Ser	Asn	Ile
645				650				655							
Val	Ile	Gly	Ile	Gly	Asp	Lys	Ala	Leu	Lys	Ile	Asn	Trp	Tyr	Arg	Lys
660				665				670							
Gly	Ser	Ser	Ile	Gly	Lys	Met	Phe	Glu	Ala	Thr	Ala	Arg	Gly	Ala	Arg
675				680				685							
Arg	Met	Ala	Ile	Leu	Gly	Asp	Thr	Ala	Trp	Asp	Phe	Gly	Ser	Val	Gly
690				695				700							
Gly	Val	Leu	Asn	Ser	Leu	Gly	Lys	Met	Val	His	Gln	Ile	Phe	Gly	Ser
705					710					715					
Ala	Tyr	Thr	Ala	Leu	Phe	Ser	Gly	Val	Ser	Trp	Ile	Met	Lys	Ile	Gly
725				730				735							
Ile	Gly	Val	Leu	Leu	Thr	Trp	Ile	Gly	Leu	Asn	Ser	Lys	Asn	Thr	Ser
740				745				750							
Met	Ser	Phe	Ser	Cys	Ile	Ala	Ile	Gly	Ile	Ile	Thr	Leu	Tyr	Leu	Gly
755				760				765							
Val	Val	Val	Gln	Ala	Asp	Met	Gly	Cys	Val	Ile	Asn	Trp	Lys	Gly	Lys
770				775				780							
Glu	Leu	Lys	Cys	Gly	Ser	Gly	Ile	Phe	Val	Thr	Asn	Glu	Val	His	Thr
785					790					795					
Trp	Thr	Glu	Gln	Tyr	Lys	Phe	Gln	Ala	Asp	Ser	Pro	Lys	Arg	Val	Ala
805				810				815							
Thr	Ala	Ile	Ala	Gly	Ala	Trp	Glu	Asn	Gly	Val	Cys	Gly	Ile	Arg	Ser
820				825				830							
Thr	Thr	Arg	Met	Glu	Asn	Leu	Leu	Trp	Lys	Gln	Ile	Ala	Asn	Glu	Leu
835				840				845							
Asn	Tyr	Ile	Leu	Trp	Glu	Asn	Asp	Ile	Lys	Leu	Thr	Val	Val	Val	Gly
850				855				860							
Asp	Ile	Thr	Gly	Val	Leu	Glu	Gln	Gly	Lys	Arg	Thr	Leu	Thr	Pro	Gln
865					870					875					
Pro	Met	Glu	Leu	Lys	Tyr	Ser	Trp	Lys	Thr	Trp	Gly	Leu	Ala	Lys	Ile
885				890				895							
Val	Thr	Ala	Glu	Thr	Gln	Asn	Ser	Ser	Phe	Ile	Ile	Asp	Gly	Pro	Ser
900				905				910							

Thr	Pro	Glu	Cys	Pro	Ser	Ala	Ser	Arg	Ala	Trp	Asn	Val	Trp	Glu	Val
		915					920					925			
Glu	Asp	Tyr	Gly	Phe	Gly	Val	Phe	Thr	Thr	Asn	Ile	Trp	Leu	Lys	Leu
	930					935					940				
Arg	Glu	Val	Tyr	Thr	Gln	Leu	Cys	Asp	His	Arg	Leu	Met	Ser	Ala	Ala
	945				950					955					960
Val	Lys	Asp	Glu	Arg	Ala	Val	His	Ala	Asp	Met	Gly	Tyr	Trp	Ile	Glu
			965						970					975	
Ser	Gln	Lys	Asn	Gly	Ser	Trp	Lys	Leu	Glu	Lys	Ala	Ser	Leu	Ile	Glu
			980					985					990		
Val	Lys	Thr	Cys	Thr	Trp	Pro	Lys	Ser	His	Thr	Leu	Trp	Ser	Asn	Gly
		995					1000						1005		
Val	Leu	Glu	Ser	Asp	Met	Ile	Ile	Pro	Lys	Ser	Leu	Ala	Gly	Pro	Ile
	1010					1015					1020				
Ser	Gln	His	Asn	His	Arg	Pro	Gly	Tyr	His	Thr	Gln	Thr	Ala	Gly	Pro
	1025				1030					1035					1040
Trp	His	Leu	Gly	Lys	Leu	Glu	Leu	Asp	Phe	Asn	Tyr	Cys	Glu	Gly	Thr
				1045					1050					1055	
Thr	Val	Val	Ile	Ser	Glu	Asn	Cys	Gly	Thr	Arg	Gly	Pro	Ser	Leu	Arg
			1060					1065					1070		
Thr	Thr	Thr	Val	Ser	Gly	Lys	Leu	Ile	His	Glu	Trp	Cys	Cys	Arg	Ser
		1075					1080						1085		
Cys	Thr	Leu	Pro	Pro	Leu	Arg	Tyr	Met	Gly	Glu	Asp	Gly	Cys	Trp	Tyr
	1090					1095					1100				
Gly	Met	Glu	Ile	Arg	Pro	Ile	Asn	Glu	Lys	Glu	Glu	Asn	Met	Val	Lys
	1105				1110					1115					1120
Ser	Leu	Ala	Ser	Ala	Gly	Ser	Gly	Lys	Val	Asp	Asn	Phe	Thr	Met	Gly
				1125					1130					1135	
Val	Leu	Cys	Leu	Ala	Ile	Leu	Phe	Glu	Glu	Val	Met	Arg	Gly	Lys	Phe
			1140					1145					1150		
Gly	Lys	Lys	His	Met	Ile	Ala	Gly	Val	Leu	Phe	Thr	Phe	Val	Leu	Leu
		1155					1160					1165			
Leu	Ser	Gly	Gln	Ile	Thr	Trp	Arg	Gly	Met	Ala	His	Thr	Leu	Ile	Met
	1170					1175					1180				
Ile	Gly	Ser	Asn	Ala	Ser	Asp	Arg	Met	Gly	Met	Gly	Val	Thr	Tyr	Leu
	1185				1190					1195					1200
Ala	Leu	Ile	Ala	Thr	Phe	Lys	Ile	Gln	Pro	Phe	Leu	Ala	Leu	Gly	Phe
				1205					1210					1215	
Phe	Leu	Arg	Lys	Leu	Thr	Ser	Arg	Glu	Asn	Leu	Leu	Leu	Gly	Val	Gly
			1220					1225					1230		
Leu	Ala	Met	Ala	Ala	Thr	Leu	Arg	Leu	Pro	Glu	Asp	Ile	Glu	Gln	Met
		1235					1240					1245			
Ala	Asn	Gly	Ile	Ala	Leu	Gly	Leu	Met	Ala	Leu	Lys	Leu	Ile	Thr	Gln
	1250					1255					1260				
Phe	Glu	Thr	Tyr	Gln	Leu	Trp	Thr	Ala	Leu	Val	Ser	Leu	Thr	Cys	Ser
	1265				1270					1275					1280
Asn	Thr	Ile	Phe	Thr	Leu	Thr	Val	Ala	Trp	Arg	Thr	Ala	Thr	Leu	Ile
				1285					1290					1295	
Leu	Ala	Gly	Ile	Ser	Leu	Leu	Pro	Val	Cys	Gln	Ser	Ser	Ser	Met	Arg
			1300					1305					1310		
Lys	Thr	Asp	Trp	Leu	Pro	Met	Thr	Val	Ala	Ala	Met	Gly	Val	Pro	Pro
		1315					1320					1325			
Leu	Pro	Leu	Phe	Ile	Phe	Ser	Leu	Lys	Asp	Thr	Leu	Lys	Arg	Arg	Ser
	1330					1335					1340				
Trp	Pro	Leu	Asn	Glu	Gly	Val	Met	Ala	Val	Gly	Leu	Val	Ser	Ile	Leu
	1345				1350					1355					1360
Ala	Ser	Ser	Leu	Leu	Arg	Asn	Asp	Val	Pro	Met	Ala	Gly	Pro	Leu	Val
				1365					1370					1375	
Ala	Gly	Gly	Leu	Leu	Ile	Ala	Cys	Tyr	Val	Ile	Thr	Gly	Thr	Ser	Ala
			1380					1385					1390		
Asp	Leu	Thr	Val	Glu	Lys	Ala	Ala	Asp	Val	Thr	Trp	Glu	Glu	Glu	Ala

1395					1400					1405					
Glu	Gln	Thr	Gly	Val	Ser	His	Asn	Leu	Met	Ile	Thr	Val	Asp	Asp	Asp
1410					1415					1420					
Gly	Thr	Met	Arg	Ile	Lys	Asp	Asp	Glu	Thr	Glu	Asn	Ile	Leu	Thr	Val
1425					1430					1435					
Leu	Leu	Lys	Thr	Ala	Leu	Leu	Ile	Val	Ser	Gly	Ile	Phe	Pro	Tyr	Ser
1445					1450					1455					
Ile	Pro	Ala	Thr	Met	Leu	Val	Trp	His	Thr	Trp	Gln	Lys	Gln	Thr	Gln
1460					1465					1470					
Arg	Ser	Gly	Val	Leu	Trp	Asp	Val	Pro	Ser	Pro	Pro	Glu	Thr	Gln	Lys
1475					1480					1485					
Ala	Glu	Leu	Glu	Gly	Val	Tyr	Arg	Ile	Lys	Gln	Gln	Gly	Ile	Phe	
1490					1495					1500					
Gly	Lys	Thr	Gln	Val	Gly	Val	Gly	Val	Gln	Lys	Glu	Gly	Val	Phe	His
1505					1510					1515					
Thr	Met	Trp	His	Val	Thr	Arg	Gly	Ala	Val	Leu	Thr	His	Asn	Gly	Lys
1525					1530					1535					
Arg	Leu	Glu	Pro	Asn	Trp	Ala	Ser	Val	Lys	Lys	Asp	Leu	Ile	Ser	Tyr
1540					1545					1550					
Gly	Gly	Gly	Trp	Arg	Leu	Ser	Ala	Gln	Trp	Gln	Lys	Gly	Glu	Glu	Val
1555					1560					1565					
Gln	Val	Ile	Ala	Val	Glu	Pro	Gly	Lys	Asn	Pro	Lys	Asn	Phe	Gln	Thr
1570					1575					1580					
Met	Pro	Gly	Ile	Phe	Gln	Thr	Thr	Thr	Gly	Glu	Ile	Gly	Ala	Ile	Ala
1585					1590					1595					
Leu	Asp	Phe	Lys	Pro	Gly	Thr	Ser	Gly	Ser	Pro	Ile	Ile	Asn	Arg	Glu
1605					1610					1615					
Gly	Lys	Val	Val	Gly	Leu	Tyr	Gly	Asn	Gly	Val	Val	Thr	Lys	Asn	Gly
1620					1625					1630					
Gly	Tyr	Val	Ser	Gly	Ile	Ala	Gln	Thr	Asn	Ala	Glu	Pro	Asp	Gly	Pro
1635					1640					1645					
Thr	Pro	Glu	Leu	Glu	Glu	Glu	Met	Phe	Lys	Lys	Arg	Asn	Leu	Thr	Ile
1650					1655					1660					
Met	Asp	Leu	His	Pro	Gly	Ser	Gly	Lys	Thr	Arg	Lys	Tyr	Leu	Pro	Ala
1665					1670					1675					
Ile	Val	Arg	Glu	Ala	Ile	Lys	Arg	Arg	Leu	Arg	Thr	Leu	Ile	Leu	Ala
1685					1690					1695					
Pro	Thr	Arg	Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Met	Lys	Gly	Leu
1700					1705					1710					
Pro	Ile	Arg	Tyr	Gln	Thr	Thr	Ala	Thr	Lys	Ser	Glu	His	Thr	Gly	Arg
1715					1720					1725					
Glu	Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Met	Arg	Leu	Leu
1730					1735					1740					
Ser	Pro	Val	Arg	Val	Pro	Asn	Tyr	Asn	Leu	Ile	Ile	Met	Asp	Glu	Ala
1745					1750					1755					
His	Phe	Thr	Asp	Pro	Ala	Ser	Ile	Ala	Ala	Arg	Gly	Tyr	Ile	Ser	Thr
1765					1770					1775					
Arg	Val	Gly	Met	Gly	Glu	Ala	Ala	Ala	Ile	Phe	Met	Thr	Ala	Thr	Pro
1780					1785					1790					
Pro	Gly	Thr	Ala	Asp	Ala	Phe	Pro	Gln	Ser	Asn	Ala	Pro	Ile	Gln	Asp
1795					1800					1805					
Glu	Glu	Arg	Asp	Ile	Pro	Glu	Arg	Ser	Trp	Asn	Ser	Gly	Asn	Glu	Trp
1810					1815					1820					
Ile	Thr	Asp	Phe	Val	Gly	Lys	Thr	Val	Trp	Phe	Val	Pro	Ser	Ile	Lys
1825					1830					1835					
Ala	Gly	Asn	Val	Ile	Ala	Asn	Cys	Leu	Arg	Lys	Asn	Gly	Lys	Lys	Val
1845					1850					1855					
Ile	Gln	Leu	Ser	Arg	Lys	Thr	Phe	Asp	Thr	Glu	Tyr	Gln	Lys	Thr	Lys
1860					1865					1870					
Leu	Asn	Asp	Trp	Asp	Phe	Val	Val	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly
1875					1880					1885					

Ala	Asn	Phe	Ile	Ala	Asp	Arg	Val	Ile	Asp	Pro	Arg	Arg	Cys	Leu	Lys	1890	1895	1900
Pro	Val	Ile	Leu	Thr	Asp	Gly	Pro	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	1905	1910	1915
Met	Pro	Val	Thr	Val	Ala	Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Val	Gly	1925	1930	1935
Arg	Asn	Pro	Gln	Lys	Glu	Asn	Asp	Gln	Tyr	Ile	Phe	Met	Gly	Gln	Pro	1940	1945	1950
Leu	Asn	Lys	Asp	Glu	Asp	His	Ala	His	Trp	Thr	Glu	Ala	Lys	Met	Leu	1955	1960	1965
Leu	Asp	Asn	Ile	Asn	Thr	Pro	Glu	Gly	Ile	Ile	Pro	Ala	Leu	Phe	Glu	1970	1975	1980
Pro	Glu	Arg	Glu	Lys	Ser	Ala	Ala	Ile	Asp	Gly	Glu	Tyr	Arg	Leu	Lys	1985	1990	1995
Gly	Glu	Ser	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Arg	Arg	Gly	Asp	Leu	2005	2010	2015
Pro	Val	Trp	Leu	Ala	His	Lys	Val	Ala	Ser	Glu	Gly	Ile	Lys	Tyr	Thr	2020	2025	2030
Asp	Arg	Lys	Trp	Cys	Phe	Asp	Gly	Glu	Arg	Asn	Asn	Gln	Ile	Leu	Glu	2035	2040	2045
Glu	Asn	Met	Asp	Val	Glu	Ile	Trp	Thr	Lys	Glu	Gly	Glu	Lys	Lys	Lys	2050	2055	2060
Leu	Arg	Pro	Arg	Trp	Leu	Asp	Ala	Arg	Thr	Tyr	Ser	Asp	Pro	Leu	Ala	2065	2070	2075
Leu	Lys	Glu	Phe	Lys	Asp	Phe	Ala	Ala	Gly	Arg	Lys	Ser	Ile	Ala	Leu	2085	2090	2095
Asp	Leu	Val	Thr	Glu	Ile	Gly	Arg	Val	Pro	Ser	His	Leu	Ala	His	Arg	2100	2105	2110
Thr	Arg	Asn	Ala	Leu	Asp	Asn	Leu	Val	Met	Leu	His	Thr	Ser	Glu	His	2115	2120	2125
Gly	Gly	Arg	Ala	Tyr	Arg	His	Ala	Val	Glu	Glu	Leu	Pro	Glu	Thr	Met	2130	2135	2140
Glu	Thr	Leu	Leu	Leu	Leu	Gly	Leu	Met	Ile	Leu	Leu	Thr	Gly	Gly	Ala	2145	2150	2155
Met	Leu	Phe	Leu	Ile	Ser	Gly	Lys	Gly	Ile	Gly	Lys	Thr	Ser	Ile	Gly	2165	2170	2175
Leu	Ile	Cys	Val	Ile	Ala	Ser	Ser	Gly	Met	Leu	Trp	Met	Ala	Asp	Val	2180	2185	2190
Pro	Leu	Gln	Trp	Ile	Ala	Ser	Ala	Ile	Val	Leu	Glu	Phe	Phe	Met	Met	2195	2200	2205
Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp	Asn	2210	2215	2220
Gln	Leu	Ala	Tyr	Val	Val	Ile	Gly	Ile	Leu	Thr	Leu	Ala	Ala	Ile	Val	2225	2230	2235
Ala	Ala	Asn	Glu	Met	Gly	Leu	Leu	Glu	Thr	Thr	Lys	Arg	Asp	Leu	Gly	2245	2250	2255
Met	Ser	Lys	Glu	Pro	Gly	Val	Val	Ser	Pro	Thr	Ser	Tyr	Leu	Asp	Val	2260	2265	2270
Asp	Leu	His	Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr	Ala	Val	Ala	Thr	Thr	2275	2280	2285
Val	Ile	Thr	Pro	Met	Leu	Arg	His	Thr	Ile	Glu	Asn	Ser	Thr	Ala	Asn	2290	2295	2300
Val	Ser	Leu	Ala	Ala	Ile	Ala	Asn	Gln	Ala	Val	Val	Leu	Met	Gly	Leu	2305	2310	2315
Asp	Lys	Gly	Trp	Pro	Ile	Ser	Lys	Met	Asp	Leu	Gly	Val	Pro	Leu	Leu	2325	2330	2335
Ala	Leu	Gly	Cys	Tyr	Ser	Gln	Val	Asn	Pro	Leu	Thr	Leu	Ile	Ala	Ala	2340	2345	2350
Val	Leu	Leu	Leu	Val	Thr	His	Tyr	Ala	Ile	Ile	Gly	Pro	Gly	Leu	Gln	2355	2360	2365
Ala	Lys	Ala	Thr	Arg	Glu	Ala	Gln	Lys	Arg	Thr	Ala	Ala	Gly	Ile	Met			

2370	2375	2380
Lys Asn Pro Thr Val	Asp Gly Ile Met Thr	Ile Asp Leu Asp Pro Val
2385	2390	2395
Ile Tyr Asp Ser	Lys Phe Glu Lys Gln Leu	Gly Gln Val Met Leu Leu
	2405	2410
Val Leu Cys	Ala Val Gln Leu Leu Leu Met Arg	Thr Ser Trp Ala Leu
	2420	2425
Cys Glu Val Leu Thr	Leu Ala Thr Gly Pro Ile Thr	Thr Thr Leu Trp Glu
	2435	2440
Gly Ser Pro Gly Lys Phe	Trp Asn Thr Thr Ile Ala Val Ser Met Ala	
	2450	2455
Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly	Ala Gly Leu Ala Leu Ser	
2465	2470	2475
Ile Met Lys Ser Val Gly Thr Gly Lys Arg Gly Thr Gly Ser Gln Gly		
	2485	2490
Glu Thr Leu Gly Glu Lys Trp Lys Lys Lys Leu Asn Gln Leu Ser Arg		
	2500	2505
Lys Glu Phe Asp Leu Tyr Lys Lys Ser Gly Ile Thr Glu Val Asp Arg		
	2515	2520
Thr Glu Ala Lys Glu Gly Leu Lys Arg Gly Glu Ile Thr His His Ala		
	2530	2535
Val Ser Arg Gly Ser Ala Lys Leu Gln Trp Phe Val Glu Arg Asn Met		
2545	2550	2555
Val Ile Pro Glu Gly Arg Val Ile Asp Leu Gly Cys Gly Arg Gly Gly		
	2565	2570
Trp Ser Tyr Tyr Cys Ala Gly Leu Lys Lys Val Thr Glu Val Arg Gly		
	2580	2585
Tyr Thr Lys Gly Gly Pro Gly His Glu Glu Pro Val Pro Met Ser Thr		
	2595	2600
Tyr Gly Trp Asn Ile Val Lys Leu Met Ser Gly Lys Asp Val Phe Tyr		
	2610	2615
Leu Pro Pro Glu Lys Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser		
2625	2630	2635
Ser Pro Ser Pro Thr Val Glu Glu Ser Arg Thr Ile Arg Val Leu Lys		
	2645	2650
Met Val Glu Pro Trp Leu Lys Asn Asn Gln Phe Cys Ile Lys Val Leu		
	2660	2665
Asn Pro Tyr Met Pro Thr Val Ile Glu His Leu Glu Arg Leu Gln Arg		
	2675	2680
Lys His Gly Gly Met Leu Val Arg Asn Pro Leu Ser Arg Asn Ser Thr		
	2690	2695
His Glu Met Tyr Trp Ile Ser Asn Gly Thr Gly Asn Ile Val Ser Ser		
2705	2710	2715
Val Asn Met Val Ser Arg Leu Leu Leu Asn Arg Phe Thr Met Thr His		
	2725	2730
Arg Arg Pro Thr Ile Glu Lys Asp Val Asp Leu Gly Ala Gly Thr Arg		
	2740	2745
His Val Asn Ala Glu Pro Glu Thr Pro Asn Met Asp Val Ile Gly Glu		
	2755	2760
Arg Ile Lys Arg Ile Lys Glu Glu His Ser Ser Thr Trp His Tyr Asp		
	2770	2775
Asp Glu Asn Pro Tyr Lys Thr Trp Ala Tyr His Gly Ser Tyr Glu Val		
2785	2790	2795
Lys Ala Thr Gly Ser Ala Ser Ser Met Ile Asn Gly Val Val Lys Leu		
	2805	2810
Leu Thr Lys Pro Trp Asp Val Val Pro Met Val Thr Gln Met Ala Met		
	2820	2825
Thr Asp Thr Thr Pro Phe Gly Gln Gln Arg Val Phe Lys Glu Lys Val		
	2835	2840
Asp Thr Arg Thr Pro Arg Pro Met Pro Gly Thr Arg Lys Val Met Glu		
	2850	2855
		2860

Ile Thr Ala Glu Trp Leu Trp Arg Thr Leu Gly Arg Asn Lys Arg Pro  
 2865 2870 2875 2880  
 Arg Leu Cys Thr Arg Glu Glu Phe Thr Lys Lys Val Arg Thr Asn Ala  
 2885 2890 2895  
 Ala Met Gly Ala Val Phe Thr Glu Glu Asn Gln Trp Asp Ser Ala Arg  
 2900 2905 2910  
 Ala Ala Val Glu Asp Glu Glu Phe Trp Lys Leu Val Asp Arg Glu Arg  
 2915 2920 2925  
 Glu Leu His Lys Leu Gly Lys Cys Gly Ser Cys Val Tyr Asn Met Met  
 2930 2935 2940  
 Gly Lys Arg Glu Lys Lys Leu Gly Glu Phe Gly Lys Ala Lys Gly Ser  
 2945 2950 2955 2960  
 Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Tyr Leu Glu Phe Glu  
 2965 2970 2975  
 Ala Leu Gly Phe Leu Asn Glu Asp His Trp Phe Ser Arg Glu Asn Ser  
 2980 2985 2990  
 Tyr Ser Gly Val Glu Gly Glu Gly Leu His Lys Leu Gly Tyr Ile Leu  
 2995 3000 3005  
 Arg Asp Ile Ser Lys Ile Pro Gly Gly Ala Met Tyr Ala Asp Asp Thr  
 3010 3015 3020  
 Ala Gly Trp Asp Thr Arg Ile Thr Glu Asp Asp Leu His Asn Glu Glu  
 3025 3030 3035 3040  
 Lys Ile Thr Gln Gln Met Asp Pro Glu His Arg Gln Leu Ala Asn Ala  
 3045 3050 3055  
 Ile Phe Lys Leu Thr Tyr Gln Asn Lys Val Val Lys Val Gln Arg Pro  
 3060 3065 3070  
 Thr Pro Lys Gly Thr Val Met Asp Ile Ile Ser Arg Lys Asp Gln Arg  
 3075 3080 3085  
 Gly Ser Gly Gln Val Gly Thr Tyr Gly Leu Asn Thr Phe Thr Asn Met  
 3090 3095 3100  
 Glu Ala Gln Leu Ile Arg Gln Met Glu Gly Glu Gly Val Leu Ser Lys  
 3105 3110 3115 3120  
 Ala Asp Leu Glu Asn Pro His Pro Leu Glu Lys Lys Ile Thr Gln Trp  
 3125 3130 3135  
 Leu Glu Thr Lys Gly Val Glu Arg Leu Lys Arg Met Ala Ile Ser Gly  
 3140 3145 3150  
 Asp Asp Cys Val Val Lys Pro Ile Asp Asp Arg Phe Ala Asn Ala Leu  
 3155 3160 3165  
 Leu Ala Leu Asn Asp Met Gly Lys Val Arg Lys Asp Ile Pro Gln Trp  
 3170 3175 3180  
 Gln Pro Ser Lys Gly Trp His Asp Trp Gln Gln Val Pro Phe Cys Ser  
 3185 3190 3195 3200  
 His His Phe His Glu Leu Ile Met Lys Asp Gly Arg Lys Leu Val Val  
 3205 3210 3215  
 Pro Cys Arg Pro Gln Asp Glu Leu Ile Gly Arg Ala Arg Ile Ser Gln  
 3220 3225 3230  
 Gly Ala Gly Trp Ser Leu Arg Glu Thr Ala Cys Leu Gly Lys Ala Tyr  
 3235 3240 3245  
 Ala Gln Met Trp Thr Leu Met Tyr Phe His Arg Arg Asp Leu Arg Leu  
 3250 3255 3260  
 Ala Ser Asn Ala Ile Cys Ser Ala Val Pro Val His Trp Val Pro Thr  
 3265 3270 3275 3280  
 Ser Arg Thr Thr Trp Ser Ile His Ala His His Gln Trp Met Thr Thr  
 3285 3290 3295  
 Glu Asp Met Leu Thr Val Trp Asn Arg Val Trp Ile Glu Asp Asn Pro  
 3300 3305 3310  
 Trp Met Glu Asp Lys Thr Pro Val Thr Thr Trp Glu Asp Val Pro Tyr  
 3315 3320 3325  
 Leu Gly Lys Arg Glu Asp Gln Trp Cys Gly Ser Leu Ile Gly Leu Thr  
 3330 3335 3340  
 Ser Arg Ala Thr Trp Ala Gln Asn Ile Leu Thr Ala Ile Gln Gln Val

3345		3350		3355		3360									
Arg	Ser	Leu	Ile	Gly	Asn	Glu	Glu	Phe	Leu	Asp	Tyr	Met	Pro	Ser	Met
				3365						3370				3375	
Lys	Arg	Phe	Arg	Lys	Glu	Glu	Glu	Ser	Glu	Gly	Ala	Ile	Trp		
				3380						3385				3390	

<210> 23  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide

<400> 23  
 cagttcctaaa ccggaagctt g 21

<210> 24  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide

<400> 24  
 ccaacgagct atcgtagctt ctctggg 27

<210> 25  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide

<400> 25  
 gattgtgacc atggcggccc atctttg 27

<210> 26  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide

<400> 26  
 ggagattagg ccgctgagcg gtaaagaaga g 31

<210> 27  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide

<400> 27  
 gtttgtggaa aaatgtctga ggagaa 26



<210> 28	
<211> 27	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide	
<400> 28	
ctaggaaaca cataatatta gttgtgg	27
<210> 29	
<211> 27	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide	
<400> 29	
cagatccacc taaccataat ggcagtg	27
<210> 30	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide	
<400> 30	
ggaaactcac ctcgggagag acagc	25
<210> 31	
<211> 26	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide	
<400> 31	
ttgggtagag gtcaccgcac tcatcc	26
<210> 32	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide	
<400> 32	
gtagaaatag ccgctctcat cctag	25
<210> 33	
<211> 30	
<212> DNA	
<213> Artificial Sequence	

<220>  
 <223> Oligonucleotide  
  
 <400> 33  
 ggcggcttac gtaatgggag gtagctcagc 30  
  
 <210> 34  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 34  
 ctagagaagg cagcttctgt gcagtgg 27  
  
 <210> 35  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 35  
 ccttgccat tccagcaaca atgac 25  
  
 <210> 36  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 36  
 gacgttcaaa ttttagccat agaacc 26  
  
 <210> 37  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 37  
 ctggagaaac gggcgccgta acattag 27  
  
 <210> 38  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 38  
 gaaattggat cggtaacctt agatttc 27

<210> 39  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 39  
 ggagcagtaa cgtttgattt caaaccc 27  
  
 <210> 40  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 40  
 gttaccaaac ctggggatta cgtc 24  
  
 <210> 41  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 41  
 gattaactat catgaactta caccc 25  
  
 <210> 42  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 42  
 ggaaaacctt tggcaccgag tatcc 25  
  
 <210> 43  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 43  
 tccagtata ccggctagcg ctgctc 26  
  
 <210> 44  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>

<223> Oligonucleotide  
 <400> 44  
 gcctcagagg tggccaaagg aag 23  
 <210> 45  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Oligonucleotide  
 <400> 45  
 acatggaggc agagatctgg actaga 26  
 <210> 46  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Oligonucleotide  
 <400> 46  
 aaagcatggc caaggatgct gtc 23  
 <210> 47  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Oligonucleotide  
 <400> 47  
 gcataatgga cgctaagcat gactaagg 28  
 <210> 48  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Oligonucleotide  
 <400> 48  
 ttattgcata gtgcacgaaa agcatg 26  
 <210> 49  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Oligonucleotide  
 <400> 49  
 gggcctatta ttacgtaatg gac 23  
 <210> 50

<211> 24  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 50  
 ctgcaatcct ggtgatatta ttgc 24  
  
 <210> 51  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 51  
 ctcataaaga acgttcaaac cct 23  
  
 <210> 52  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 52  
 cattagacag acgcgagttt gaag 24  
  
 <210> 53  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 53  
 tggcgacgct caagatagtg actgaag 27  
  
 <210> 54  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 54  
 gagtcatcat cgataccaac aatag 25  
  
 <210> 55  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide

<400> 55 cttcaaaacc tggcttctgc atcaaag	27
<210> 56 <211> 28 <212> DNA <213> Artificial Sequence	
<220> <223> Oligonucleotide	
<400> 56 caaagatggt gagcaacagg ttcacaac	28
<210> 57 <211> 27 <212> DNA <213> Artificial Sequence	
<220> <223> Oligonucleotide	
<400> 57 ggaaagaaga aacacccgag actgtgc	27
<210> 58 <211> 25 <212> DNA <213> Artificial Sequence	
<220> <223> Oligonucleotide	
<400> 58 gggaactggt cgatcgagaa agggc	25
<210> 59 <211> 28 <212> DNA <213> Artificial Sequence	
<220> <223> Oligonucleotide	
<400> 59 ccagtggatt actacagaag atatgctc	28
<210> 60 <211> 29 <212> DNA <213> Artificial Sequence	
<220> <223> Oligonucleotide	
<400> 60 caggaacctg accggtaaag aggaatacg	29
<210> 61 <211> 28	

<212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 61  
 ctgtaattac caacatcaaa caccaaag 28  
  
 <210> 62  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 62  
 ccaacaacaa ccaccaaagg ctattg 26  
  
 <210> 63  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligonucleotide  
  
 <400> 63  
 ggattggtgt tgtcgatcca acagg 25  
  
 <210> 64  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Primer  
  
 <400> 64  
 ctggtggaag cccaacacaa aaac 24  
  
 <210> 65  
 <211> 45  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Primer  
  
 <400> 65  
 ctggtggaag gaagagagaa attggcaact cccaacaca aaaac 45  
  
 <210> 66  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Primer

<400> 66	
agaccccccc aagcatattg ac	22
<210> 67	
<211> 39	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Primer	
<400> 67	
agaccccccc aatatttcct cctcctatag catattgac	39
<210> 68	
<211> 21	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Primer	
<400> 68	
cccaacacaa agcatattga c	21
<210> 69	
<211> 6	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide	
<221> misc_feature	
<222> (1)...(6)	
<223> n = A,T,C or G	
<400> 69	
gcagcn	6
<210> 70	
<211> 5	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide	
<400> 70	
gcagc	5